PACIFIC UNDERGRADUATE
RESEARCH AND CREATIVITY CONFERENCE 2016

16TH ANNUAL

Program & Abstracts

16th Annual

Pacific

Undergraduate

Research &

Creativity

Conference

PURCC-2016

University of the Pacific
Stockton, CA 95211

April 25 – May 14, 2016

Program

April 25 - May 14

Senior Graphic Design Exhibition
Reynolds Art Gallery

Studio Art Exhibition
Studio Art Building

April 30 - Research Day

Oral Session 1
8:00 AM – 10:00 AM

Oral Session 2
10:00 AM – 12:00 PM

DeRosa University Center, Room 211

Poster Session 1
10:00 AM – 12:00 PM
DeRosa University Center, Ballroom

Oral Session 3
1:00 PM – 3:00 PM

Oral Session 4
3:00 PM – 5:00 PM

DeRosa University Center, Room 211

Eberhardt School of Business Product Innovation Fair
1:30 PM – 3:30 PM
DeRosa University Center, Room 214-215

Poster Session 2
1:30 PM – 3:30 PM
DeRosa University Center, Ballroom

May 3

Psychology Department Research Day
5:30 – 6:30 PM
Vereschagin Alumni House

May 3 - 4

Composer's Club Concerts

May 3, 7:30 PM
Recital Hall

May 4, 7:30 PM
Faye Spanos Concert Hall

May 7

Engineering and Computer Science Senior Project Demonstrations
2:30 – 4:00 PM
School of Engineering and Computer Science

May 10

Pacific Student Film Showcase
7:00 – 10:00 PM
Janet Leigh Theatre

Senior Graphic Design Exhibition – Reynolds Art Gallery

Artist	Title	Faculty Mentor
Margaret Brunet	Do Good Desgin	Brett DeBoer
Jana Burkard	Identity Design	Brett DeBoer
Jordan Capper	Experimental Letterpress	Brett DeBoer
Katie DeWitt	E. McKnight Kauffer Banner Series	Brett DeBoer
Ann Fitzpatrick	The Art of the Zine	Brett DeBoer
Marissa Lewis	Got A Taste For Something Sweet	Brett DeBoer
Dante Pasquini	A Beautiful Mind	Brett DeBoer
Alec Shigeta	California Academy of Sciences Poster Series	Brett DeBoer
Kristi Tom	Event Design	Brett DeBoer

Studio Art Exhibition – Studio Art Building

Artist	Title	Faculty Mentor
Daniella Arostigui Cabrera	Glimpses of Femininity	Monika Meler
Andrew Ciminelli	Challenged Perspectives	Daniel Kasser Monika Meler
YiFei Di	Portfolio	Monika Meler Lucinda Kasser
Joe Soto Jr.	Soto Surreal	Monika Meler
Jiachun Wang	A Picture is Worth a Thousand Words	Monika Meler Lucinda Kasser Daniel Kasser
Anneka Weinert	Reflections on Shalom	Monika Meler Lucinda Kasser
Ray Wong	San Francisco Afterhours	Monika Meler

Oral Session 1 - Moderator: James Haffner

Time	Student Presenter	Presentation Title	Faculty Mentor(s)
8:00	**Brian Estes** *Organizational Behavior*	**Effectiveness of Telecommuting Managers and Managing Telecommuters**	Qingwen Dong *Communications*
8:20	**Luis Reyes** *Organizational Behavior*	**Work-Life Balance: The Benefits and Challenges It Poses on Men**	Qingwen Dong *Communications*
8:40	**Monique White** *Organizational Behavior*	**Is Trust Critical Between Social Identity and Job Satisfaction**	Qingwen Dong *Communications*
9:00	**Gitaine Reis** *Communication*	**Social Media and Organizational Transparency: A Case Study of McDonalds' Customer Engagement Campaign**	Heather Hether *Communication*

2015 Pacific Fund Summer Undergraduate Research Fellowship Project

Time	Student Presenter	Presentation Title	Faculty Mentor(s)
9:20	**Cecilia Salinas** *Music Management*	**Under the Covers: The Production of an A Cappella Cover Album**	Keith Hatschek *Consservatory of Music*
9:40	**Madelaine Matej** *Vocal Performance*	**Don't Look Back! A Eurydice Retrospective**	James Haffner *Conservatory of Music*

Oral Session 2 - Moderator: Sarah Waltz

Time	Student Presenter	Presentation Title	Faculty Mentor(s)
10:00	**Kimberly Contreras** *Music History*	**An Unhappy Union: The Rise and Fall of Dual Conducting**	**Sarah Waltz** *Music History*
10:20	**Sarah Jordan** *Music Composition*	**Effects of World War I on British Women Composers**	**Sarah Waltz** *Music History*
10:40	**Nathaniel Pergamit** *Music History*	**The Story of the Storyteller: The Real Story in Rimsky-Korsakov's Scheherazade**	**Sarah Waltz** *Music History*
11:00	**Courtney Bye** *Applied Economics*	**Assessing the Importance of Infrastructure in Emerging Economies: A Cross-Country Study of Infrastructure and Income Inequality**	**William Herrin** *Economics*
11:20	**Sandra Mendez** *Business Economics*	**Housing Prices and The Gini Index**	**William Herrin** *Economics*
11:40	**Rob Mees** *Sociology*	**Vape Culture Among Young People**	**Ruth Lewis** *Sociology*

Oral Session 3 – Moderator: Jeffrey Hole

Time	Student Presenter	Presentation Title	Faculty Mentor(s)
1:00	**Oula Miqbel** *Philosophy*	**Cultural Posturing and Religious Assimilation**	**Eleanor Wittrup** *philosophy*
1:20	**Natasha Popowich** *English*	**Formation**	**Cynthia Dobbs** *English*
1:40	**Sarah Unger** *English*	**Reflection of 1950's Society Through Fashion**	**Kris Alexanderson** *History*
2:00	**Kathryn Harlan-Gran** *English*	**From Page to Stage: How Performance Illuminates Gender Dynamics in Shakespearean Plays**	**Courtney Lehmann** *English*
2:20	**Alisha Rodriguez** *Civil Engineering*	**Feminism in Engineering**	**Jeffrey Hole** *English*
2:40	**Domenic Suntrapak** *Asian Language and Culture Studies: Japanese Program*	**Analyzing Angel's Egg**	**Jeffery Hole** *English*

Oral Session 4 – Moderator: Tara Thiemann

Time	Student Presenter	Presentation Title	Faculty Mentor(s)
3:00	**Jodi Tai** *English*	**Turning a Blind Eye: Hollywood's Colonialist Framing of Human Trafficking**	**Jeffrey Becker** *Political Science*
3:20	**Vida Bao** *Biological Sciences*	**Memoirs from Women in the 1960s-1970s: Collective Yet Fractured and Ignored**	**Edie Sparks** *History*
3:40	**Kiran Mazloom** *Biological Sciences*	**Characterizing Organophosphate Resistance in the Mosquito Culex tarsalis**	**Tara Thiemann** *Biological Sciences*
4:00	**Nathaniel Van Ryn** *Biological Sciences*	**Do Mosquitoes Feed On Individual Chickens Equally, and why is it Important?**	**Tara Thiemann** *Biological Sciences*
4:20	**Brian Pham** *Chemistry*	**Design and Synthesis of Dizinc and Dicopper Complexes**	**Qinliang Zhao** *Chemistry*
4:40	**LeRoi de-Souza** *Chemistry*	**Sollid Phase Peptide Synthesis**	**Jianhua Ren** *Chemistry*

Table	Student Presenter(s)	Poster Title	Faculty Mentor(s)
1	**Sarah Yung** *English/Film Studies*	**Xiao Qingxin: Small Fresh Street Style and Beyond**	**Courtney Lehmann** *Department of English*
	2015 Pacific Fund Summer Undergraduate Research Fellowship Project		
2	**David Carranza** *Economics*	**The Next Frontier of American Health Insurance: A Panel Analysis of the Long-Term Care Insurance Market**	**Michelle Amaral** *Economics*
	2015 Pacific Fund Summer Undergraduate Research Fellowship Project		
3	**Jenny Liu** **Sierra Kanetake** **Yun-hsuan Wu** *Biological Sciences*	**In vitro anti-protozoal activity of the plant glycoalkaloid tomatine**	**Kirkwood Land** *Biological Science*
4	**Yun-hsuan Wu** *Biological science* **Jenny Liu** *Pre-Dentistry*	**In vitro anti-protozoal activity of ferrocenyl-chalcones-isatin conjugates on Trichomonas vaginalis**	**Kirkwood Land** *Biological Science*
5	**Tyler Fernandez** **Derek Eells** **Nicholas Vaughn** *Computer Engineering*	**Topographic and Bathymetric Mapping**	**Elizabeth Basha** *Electrical & Computer Engineering*
6	**Katie Perez** **Jillian Yelinek** *Psychology*	**Emotion Displays in Storybooks within American Culture**	**Jessica Grady** *Psychology*
7	**Lois Chan** **Aroosa Ahmed** *Psychology*	**Effect of paper size and condition on recycling**	**Carolynn Kohn** *Psychology*
8	**Kay Chung** **Younjin Lee** **Younyoung Lee** *Biological Sciences*	**Analysis of Black Widow's scaffolding fibers**	**Craig Vierra** *Biological Sciences*
9	**Ashneet Dhillon** **Jonathan Sir** **Brian Woo** **Brian Park** **Justin Lee** *Biological Sciences*	**Identification of New Proteins in Black Widow Spider Egg Case Silk Using Mass Spectrometry**	**Craig Vierra** *Biological Sciences*
10	**Stacy Cho** **Jessica Huynh** *Pre-Dentistry*	**An SMC-like protein is required for hormogonium motility in the filamentous cyanobacterium Nostoc punctiforme**	**Doug Risser** *Biology*
11	**Nahid Kadirzada** *Applied Economics*	**An Analysis of Education in Sub-Saharan Africa**	**William Herrin** *Economics*
11	**Adriaa Panjota** **Mason Tian**	**A hybrid histidine kinase/response regulator is required for hormogonium development in Nostoc punctiforme**	**Doug Risser** *Biological Sciences*

Table	Student Presenter(s)	Poster Title	Faculty Mentor(s)
12	**Colby Chase** **Michelle Comroe** **Alston Trinh**	**Examining the Interaction of the T. vaginalis Homologues of RAD51 and DMC1 with TvBRCA2 via Co-Immunoprecipitation**	**Lisa Wrischnik** *Biological Sciences*
13	**Kevin Chung** **Sarah Baik** *Pre-Dentistry*	**Examining the Role of Cystatins in Regulating Trichomonas vaginalis Activity in Co-culture with HeLa cells**	**Lisa Wrischnik** **Kirkwood Land** *Biological Sciences*
14	**Christopher Geeter** *Electrical Engineering* **Antonio Calderon** *Engineering Physics* **Seung Ki Song** *Electrical Engineering* **Viseith Le** *Computer Engineering*	**Brain Controlled Robot**	**Elizabeth Basha** **Ken Hughes** *Electrical & Computer Engineeering*
15	**Danielle Cummings** **Jade Vo** **Erika Brindopke** *Psychology*	**Self-Reported Alcohol Consumption: It Doesn't Add Up**	**Carolynn Kohn** *Psychology*
16	**Swaja Khanna** *Psychology*	**South Asian Americans in Law**	**Xiaojing Zhou** *English, Ethnic Studies*
17	**Eric Fu** **Ryan Park** **Jason Lee** *Biological Sciences*	**In-Depth Proteome Analysis of Black Widow Dragline Spider Silk**	**Craig Vierra** *Biological Sciences*
18	**Amun Rattan** **Rishin Patel** **Calvin Phen** *Biological Sciences*	**Proteomic Analysis of Scaffolding Silk Fibers from Black Widow Spiders**	**Craig Vierra** *Biological Sciences*
19	**Ryan Park** *Pre-Dentistry* **Angela Hwang** *Exploratory Ntrl Science*	**Characterizing phototactic behavior at the individual filament level for the filamentous cyanobacterium Nostoc punctiforme**	**Doug Risser** *Biological Sciences*
20	**Alexis Arenz** *Biological Sciences*	**The evolution of sexual dimorphism: A sex-specification gene in the dimorphic eyes of a crustacean.**	**Ajna Rivera** *Biological Sciences*
21	**Alex Kim** *Pre-dent/ Biological Sciences* **Luke Carreon** *Biological Sciences* **Alysia Mascolo** *Pre-dent/ Biological Sciences*	**Examining the Interaction of the T. vaginalis homologues of RAD51 and DMC1 with TvBRCA2 via Yeast 2-Hybrid Assays**	**Lisa Wrischnik** *Biological Sciences*
22	**Celja Uebel** *Biological Sciences*	**Examining the Transcriptional Upregulation of Rad51 and Dmc1 in Trichomonas vaginalis**	**Lisa Wrischnik** *Biological Sciences*
23	**Karen Chung** *Biological Sciences*	**Neural pathologies in an impact-acceleration model of traumatic brain injury in mice**	**Robert Rigor** *Biological Sciences*

Table	Student Presenter(s)	Poster Title	Faculty Mentor(s)
24	**Supriya Kazi** **Karen Chung** **Audrey Min** **Tim Park** *Biological Sciences* **Anish Patel** *Biochemistry*	**Protein Kinase C and D Isoform Signaling at the Blood-Brain Barrier in Response to Interleukin-1β**	**Robert Rigor** *Biological Sciences*
25	**Joshua Arucan** *Bioengineering*	**Development of a Drug Dissolution Test and Automated Analysis Method Using a Quartz Crystal Microbalance**	**Shelly Gulati** *Bioengineering*
25	**Colleen Motoyasu** **Brad Hirayama** *Bioengineering*	**A MICROFLUIDIC DEVICE FOR MARKING SMALL TISSUES**	**Shelly Gulati** *Bioengineering*
26	**Julian Shen** **Andrew Sun** **Christine Park** *Biological Sciences* **Stephen Do** *Biochemistry*	**IDENTIFICATION AND ANALYSIS OF PROTEINS IN SPIDER TUBULIFORM SILK**	**Craig Vierra** *Biological Sciences*
27	**James Choi** **Winston Limhengco** **Jackie Dong** **Lily Chen** **Lily Chen** *Pre-Dentistry/Biological Sciences*	**Identifying Novel CReP-Binding Proteins**	**Douglas Weiser** *Biological Sciences*
28	**Nicole Laskosky** **Voon Chi Chia** **Stephanie Gee** **Mark Morozumi** **Angie Wei** *HESP*	**The Effects of Academic Stress on Force Output**	**Courtney Jensen** *HESP*
29	**Teralyn Dodds** *Athletic Training*	**The use of a platelet rich plasma injection for a 2nd degree ulnar collateral ligament sprain in a female olympic water polo player**	**Christopher Ludwig** *HESP*
30	**Kai Her** **Aaron Hang** **Jimmy Suliman** **Chaeeun Kim** **Mary Tran** **Christina Uribe** *Biological Sciences*	**The Role of BGS13 in Supersecretion in Pichia pastoris**	**Geoff Lin-Cereghino** **Joan Lin-Cereghino** *Biological Sciences*
30	**Vivian Tam** *Pre-Pharmacy* **zill-e-huma khan** *Biological Sciences*	**Mat Alpha Leader Analysis for Pichia Pastoris Secretion**	**Geoff Lin-Cereghino** **Joan Lin-Cereghino** *Biological Sciences*
31	**Kylee Schesser** *Shelly Gulati*	**Characterization of Thin Film Application Parameters for Drug Dissolution Testing Using a Quartz Crystal Microbalance**	**Shelly Gulati** *Bioengineering*

Table	Student Presenter(s)	Poster Title	Faculty Mentor(s)
32	**Rachel Flores** **Chase Crimmins** *Bioengineering*	**SPECT Image Processing: MATLAB as an Image Processing Tool for Nuclear Medicine**	**Huihui Xu** *Bioengineering*
33	**Messina Fotinos** *Biological Sciences*	**The role of CReP in reversing eIF2-alpha phosphorylation after ER stress**	**Douglas Weiser** *Biological Sciences*
33	**Gene Park** **Wesley Hung** *Biological Sciences*	**Role of Zip Kinase in the Development of Early Embryonic Cells**	**Douglas Weiser** *Biological Sciences*
35	**Sierra Gonzalez** *Communication*	**The Destructive Patriarchy Inherent in Women's Advertisements**	**Paul Turpin** *Communication*
36	**Lindsey Nielson** *Business*	**Hope Street Mentorship for At-Risk Youth**	**Dylan Zorea** *Pre-law*

Table	Student Presenter(s)	Poster Title	Faculty Mentor(s)
1	**Johnson Liu** *Chemistry*	**Computational Investigation into the Nature of Technetium-Technetium Bonding Within the Octachloroditechnetate (Tc2Cl82- / 3-) Anions**	**Anthony Dutoi** *Chemistry*
		2015 Pacific Fund Summer Undergraduate Research Fellowship Project	
2	**Sruti Elson** *Chemistry-Biology* **Vivian Chen** *Biochemistry*	**Knob-Socket To 'Em: Investigating Protein/DNA Binding Interactions Using the Knob Socket Model**	**Jerry Tsai** **Hyun Joo** *Chemistry*
3	**Isabella Tran** *Chemistry* **Alexander Huynh** *Pre-Pharmacy*	**Cuprophilicity in Dicopper Complexes Supported by Formamidinates**	**Qinliang Zhao** *Chemistry*
4	**Amy Ahn** *Biological Sciences* **Carolyn Pak** *Pre-pharmacy* **Janice Park** *Pre-pharmacy*	**Effects of heat wave on thermal performance of immune function**	**Zachary Stahlschmidt** *Biological Sciences*
5	**Dustin Johnson** *Biological Sciences*	**Dietary and Spatial Preferences of Urban Ants**	**Zachary Stahlschmidt** *Biological Sciences*
6	**Jessica Robinson** **Allison Jones** *Geology* **Allison Severson** *Colorado School of Mines* **Brianna Barber** *Environmental Studies* **Samuel Noethe** *University of Illinois*	**Preliminary outcrop-scale Rf/ϕ petrofabric analysis of conglomerate from the Jurassic Tuttle Lake Formation; Mount Tallac roof pendant, El Dorado County, CA**	**Kurtis Burmeister** *Geological & Environmental Sciences*
7	**Caitlin Ha** *Biological Sciences*	**The amphibian portrait: individual identification of túngara frogs through image recognition software**	**Marcos Gridi-Papp** *Biological Sciences*
8	**Jesse Herche** **Alice Lin** *Biological Sciences*	**Auditory tuning disparities in túngara frogs (Engystomops pustulosus) - comparing hearing pathways through midbrain recording.**	**Marcos Gridi-Papp** *Biological Sciences*
9	**Alice Huang** *Pre-dentistry* **Marcos Gridi-Papp** *Biological Sciences*	**The Auditory Morphology of the Tungara Frog**	**Marcos Gridi-Papp** *Biological Sciences*
10	**Mingheng Ling** *Chemistry*	**Effect of cations on the melting behavior of a triplex DNA**	**Liang Xue** *Chemistry*

Table	Student Presenter(s)	Poster Title	Faculty Mentor(s)
11	**Chandani Khana** *Biological Sciences* **Justine Beyer** *Pre-Denstisty* **Kori Jones** *Diversified Education: Concentration in Science* **James Kamada** *Biological Sciences*	**Noise-Modeling**	**Stacie Hooper** *Biological Sciences*
12	**Mina Afnan Yeona Lee** *Biological Sciences* **Eileen Rad** *Biochemistry*	**The Relationship Between Whistle Structure and Behavioral Context In Bottlenose Dolphins**	**Stacie Hooper** *Biological Sciences*
13	**Janice Park Carolyn Pak** *Pre-pharmacy*	**Effects of Nutrition on Developmental Plasticity of Growth in Wing-Dimorphic Crickets**	**Zachary Stahlschmidt** *Biological Sciences*
14	**Amrita Ramiya** *Biological Sciences*	**How does stress influence performance anxiety in field crickets?**	**Zachary Stahlschmidt** *Biological Sciences*
15	**Hans Lee Su Jee Noh Alec Tai** *Pre-Dentistry* **Anahi Pelayo** *Biological Sciences* **Lan-Anh Ho Tracy Ho** *Pre-Dentistry*	**College of the Pacific Herbarium**	**Mark Brunell** *Biological Sciences*
16	**Kristie Huie** *Pre-Dentistry/Biological Sciences*	**The acoustic performance of the middle ear in túngara frogs, Engymostops pustulosus**	**Marcos Gridi-Papp** *Biological Sciences*
17	**Ariana Shulman Brittany Watu** *Biological Sciences*	**Triggers of Oviposition in Túngara Frogs**	**Marcos Gridi-Papp** *Biological Sciences*
18	**Anais Tsai** *Saint Mary's High School* **Betty Lee** *Biological Sciences*	**The effect of pH on substrate preferences in the túngara frog (Engystomops pustulosus)**	**Marcos Gridi-Papp** *Biological Sciences*

2015 Pacific Fund Summer Undergraduate Research Fellowship Project (Betty Lee)

Table	Student Presenter(s)	Poster Title	Faculty Mentor(s)
19	**Jung In Choi** *Biological Sciences*	**Steered Molecular Dynamics Design**	**Charles McCallum** *Chemistry*
20	**Bianca Rojo** *Biochemistry* **Sung-Hun Cho** *Pre-Dentistry/ Biological Sciences*	**Synthesis of Uncommon 6,6-linked Disaccharides Analogs**	**Andreas H Franz** *Chemistry*

Table	Student Presenter(s)	Poster Title	Faculty Mentor(s)
21	**Zaina Chaban** *Biological Sciences* **Alex Hussar** *Biochemistry*	**De novo Design of Homodimerizing Protein by use of the Knob-Socket Model**	**Jerry Tsai** *Chemisry*
22	**Sean Nakada** *Biochemistry* **Matthew Fraund** *Chemistry* **Don Pham** *Biochemistry*	**Characterization of Zinc Oxide Quantum for the purpose of Solar Cells**	**Ryan Moffet** *Chemistry*
23	**Ashley Abraham** *Bioengineering* **Dakota Smith** *Biological Sciences*	**Frog Fondness: Bloodfeeding Patterns of Neoculex Mosquitoes**	**Tara Thiemann** *Biological Sciences*
24	**Katy Abraham** *International Relations* **Vida Bao** *Biological Sciences*	**Life history is correlated with population structure in endangered Bay Area butterflies**	**Ryan Hill** *Biological Sciences*
25	**Kevan Shergill** *Biological Sciences*	**Bloodfeeding Patterns of Culex tarsalis and Culex pipiens Mosquitoes in San Joaquin County**	**Tara Thiemann** *Biological Sciences*
26	**Grace Chang** **Ashley Koh** *Biological Sciences* **Lily Tieu** *Geological and Environmental Sciences* **Leanne Tran** *Biological Sciences*	**Comparing the immature stage morphology of Speyeria callippe subspecies to assess convergence in adult phenotypes**	**Ryan Hill** *Biological Sciences*
27	**John Hitzfield** **Stuart Adam** *Biological Sciences*	**Do Speyeria callippe populations show effects of human habitat disturbance?**	**Ryan Hill** *Biological Sciences*
29	**Alisha Cheng** *Biochemistry*	**Knob-Socket Mapping of a-Helical Proteins**	**Jerry Tsai** **Hyun Joo** *Chemistry*
30	**Jihee Yoon** **Irene Lang** *Pre-Dentistry*	**Knob Socket Analysis of Beta Amyloid Proteins**	**Jerry Tsai** **Hyun Joo** *Chemistry*
31	**Alan Williams** *Pre-Dentistry*	**Blood Meal Analysis of Culex thriambus and Culiseta particeps**	**Tara Thiemann** *Biological Sciences*
32	**Kelly Inuzuka** *Bioengineering*	**Locomotor mimicry among unpalatable butterflies**	**Ryan Hill** *Biological Sciences*
32	**Lindsay Wourms** **Danish Farzad** *Biological Sciences*	**Characterizing Bay Area Speyeria butterflies: what is S. zerene sonomensis?**	**Ryan Hill** *Biological Sciences*
33	**Ashley Butts** *Applied Mathematics*	**Infinite Families of Subgraphs in Coloring Graphs**	**Larry Langley** *Mathematics*
33	**Timothy Shumate** *Mathematics*	**Echoes of the Past**	John Mayberry *Mathematics*

2015 Pacific Fund Summer Undergraduate Research Fellowship Project

Eberhardt School of Business Product Innovation
DeRosa University Center, Rooms 214-215

Faculty Mentor: Suzanne Walchli

<u>Student Presenter(s)</u>	<u>Project Title</u>
Juan Abundes *MBA* **Shahad Alsehli** *MBA* **Neil Reiher** *Business Marketing* **Xiaodi Li** *Business Marketing*	**Componi Brewing System**
Lea Baron *International Business* **Mario Arreguin** *Business* **Max Huston** *Business* **Kristen Wong** *Business*	**Hawt Dayum**
Momori Hirabayashi *Business* **Kevin Wong** *Business* **Jonathan Collins** *Business* **Rachel Robichaux** *Business*	**Nothing To Wear**
Mushel Kazmi *Business Administration* **Sydney Stanfill** *Business Administration* **Sarah Nitschke** *Business Administration*	**Gym Check System**
Matt Lee *Business Admin* **Conner Bitzer** *Business* **Mitchell Guillen** *Business* **SJ Maeng** *Business* **Malea Parcasio-Eshelman** *Business*	**Collegiate Nightlife App**

Student Presenter(s)	Poster Title	Faculty Mentor(s)
Ebubeze Anene **Mati Long**	**The Effect of Conflict and Violent Television on Stress Levels**	Jessica Grady
Jocelyn Camargo **Ebubeze Anene** **Tracy Liu**	**An examination of the relationship between stress and entertainment**	Jessica Grady
Lois Chan **Aroosa Ahmed**	**Effect of paper size and condition on recycling**	Carolynn Kohn
Danielle Cummings **Jade Vo** **Erika Brindopke**	**Self-Reported Alcohol Consumption: It Doesn't Add Up**	Carolynn Kohn
Brianna Fonseca **Keaton Loui**	**The Effect of Videos and Actions on Charitable Behavior**	Jessica Grady
Maricruz Lozano **Clarissa Medrano** **Heather Mills**	**The Effects of Individuals' Ratings of the Competency of Others with Tattoos and Piercings**	Jessica Grady
Katie Perez **Jillian Yelinek**	**Emotion Displays in Storybooks within American Culture**	Jessica Grady

May 3rd, 7:30 PM - Recital Hall

A Bedtime Suite…………………………………………………....…..David Dryfoos

    I. To Bathe a Boa

    II. There's a Nightmare in My Closet

    III. Goodnight Moon

Paulina Ramirez, soprano
Joy Chiang, piano

Somewhere or Other…………………………………………… ……Zach Franklin

Sydney Gorham, soprano
Monica Johnson Swope, piano

1933………………………………… …………………………………… …Jason Thompson

Sabrina Boggs, violin
Joanne Wu, violin
Krista Swenson, viola
Jonathan Ivy, cello

Night Terrors……………………………………………………… …...Jesse McMilin

Erin Love, soprano saxophone
Chris Sacha, alto saxophone
Mark Sarris, tenor saxophone
Beau Haygood, baritone saxophone

Arachne – Woven Intricacies……………………………………… …….Zach Franklin

Micah Vogel, violin
Sabrina Boggs, violin
Ryan Villahermosa, viola
Jon Ivy, cello

May 4th, 7:30 PM - Faye Spanos Concert Hall

A Normal Life……………………………………………… …………Josh Brent

    I. Birth/Childhood

    II. Adolescence

    III. Adulthood

    IV. Old Age

Shirley Wang, flute
Tiffany Fajardo, oboe
Jerry Criswell, clarinet
Jenna Benson, bassoon
Kary Caboose, horn

Euphonius…………………………………… ……………………………..David Dryfoos

Amanda Cariati, euphonium

[i carry your heart with me(i carry it in]………………… ……………….Thomas Ravago

Paulina Ramirez, Alison Willmann, Bryndis Reed; soprano
Annie Horschman, Natalie Winzen, Carrie Parret, Katie Steffanic; alto
Justin Pratt, Luke Colbert, Nate Pergamit, Zach Franklin; tenor
Steven Lam, Eddie Tavalin, Scott Nelson, Riley Lindsey; bass
Ethan Albala, conductor

Lambadamy……………………………………………………………………..Scott Nelson

Percussion Ensemble

Green-lit Daisy…………………………………… ……………………………Zach Franklin

Alec Flatness, Christian Tudino, Andrew Cardwell; percussion

Elements……………………………………… …………………….……………Jared Keffer

Savannah Bailey, Natalie Winzen, Annie Horschman; soprano
Jessica Rinehart, alto
Luke Colbert, tenor
Riley Lindsey, bass

Bioengineering:

Student Presenters	*Project Title*	*Faculty Mentor(s)*
Joshua Arucan **Davin Kaing** **Cameron Shields** **Muhammad Waqas**	**Noninvasive Blood Alcohol Measurement System Senior Project**	**H***uihui* **Xu** *Bioengineering*
Amy Bolme **Brandon Bell** **Matt Mannshardt**	**3D Printed Prosthetic Arm with EMG Controls**	**Huihui Xu** *Bioengineering*
Brad Hirayama **Tyler Fraser** **Thi-Vu Huynh** **Greg Trenk**	**Portable Shoulder Rehabilitation Device**	**Huihui Xu** *Bioengineering*
Kylee Schesser **Chase Crimmins** **Jujhar Bedi**	**Wearable American Sign Language Translation Device**	**HuiHui Xu** *Bioengineering*

Civil Engineering:

Student Presenters	*Project Title*	*Faculty Mentor(s)*
Jordyn Doyle **Susana Valencia** **Robert Carter** **Christopher Welch**	**San Joaquin County Regional Sports Complex: Soccer Field Redesign**	**Luke Lee** *Civil Engineering*
Thomas Livensparger **Jeremy Sopoaga** **Ryan Gleave** **Pha Tran**	**Calaveras Housing and Land Redevelopment Project**	**Luke Lee** *Civil Engineering*
Hayley Palilla **Ryan Teixeira** **Sierra Brandt** **Chad Kumabe**	**NSJWCD Pump Station and Irrigation Distribution System**	**Luke Lee** *Civil Engineering*
Ellen Tiedemann **Georgia te Velde** **Giles Domkam** **Abdulla Alolayan**	**Robb Garden Renovation & Development Project**	**Luke Lee** **Gary Litton** **Camilla Saviz** **Hector Estrada** *Civil Engineering*

Computer Science:

Student Presenter(s)	*Project Title*	*Faculty Mentor(s)*
Tyler Anderson Chris Bolt	Regent	**Michael Doherty** *Computer Science*
Marcus Barnes	AndroSax	**Michael Doherty** *Computer Science*
Bren Codie Belen Brendan Soper	AppFinder	**Michael Doherty** *Computer Science*
Micah Byerly Andrew Mora Trevor Martin	Loop - A Way to Stay in the Know	**Michael Doherty** *Computer Science*
Stephen Carpenter Glenn Contreras Deana Ceja Scott Jones	Commuter Alarm Clock	**Michael Doherty** *Computer Science* **Emma Hayes** *Computer Science*
Steven Feltner Cameron Cowan Neha Tammana	SafeChat	**Michael Doherty** *Computer Science*
Cameron Franke	Project GIRO	**Michael Doherty** *Computer Science*
John Kaehler	Pacific Fantasy Sports	**Michael Doherty** *Computer Science*
Edward Kim	MYO Camera	**Michael Doherty** *Computer Science*
Andrew Lemley David Ngo Daniel Urabe	Ocu-Cross	**Michael Doherty** *Computer Science*
Michael Morelli	GlassFinder	**Michael Doherty** *Computer Science*
Bri Prebilic Cole Kyle Shepodd	The Artist "Obsolution" Project	**Michael Doherty** *Computer Science*
Lukas Rickard Jake MacMillan	Code Workstation	**Michael Doherty** *Computer Science*
Gary Roberts	LTE Tester	**Michael Doherty** *Computer Science*
Jack Shih	Integrating Google Analytics into Storage Snapshot	**Michael Doherty** *Computer Science*
Jared Weiler	Creation Clothing Application	**Michael Doherty** *Computer Science*
Lavern Zhang Alexander Flores	A La Minute	**Michael Doherty** *Computer Science*

Electrical and Computer Engineering:

Student Presenter(s)	*Project Title*	*Faculty Mentor(s)*
David De La Vega **Taylor Morlan** *Computer Engineering* **Mike Carroll** *Electrical Engineering*	**Quad Control-Voltage/Pulse Delay Generator Buchla 200 Synthesizer Module**	**Ken Hughes** *Electrical and Computer Engineering*
Christopher Geeter *Electrical Engineering* **Antonio Calderon** *Engineering Physics* **Seung Ki Song** *Electrical Engineering* **Viseith Le** *Computer Engineering*	**Brain Controlled Robot**	**Elizabeth Basha** *Engineering and Computer Science* **Ken Hughes** *Engineering and Computer Science*
Connor Morales *Computer Engineering, Electrical Engineering* **Hassan Jahami** *Electrical Engineering*	**Audio Phaser and Equalizer**	**Ken Hughes** **Rahim Khoie** *Electrical and Computer Engineering*
Jason Forslin *Engineering Physics* **Thomas Snider** *Computer Engineering* **Thomas Vogel** *Engineering Physics* **Logan Chavez** *Computer Engineering*	**LASER Warfare**	**Jennifer Ross** **Rahim Khoie** **Ken Hughes** *Electrical and Computer Engineering*
Greg Lehr *Computer Engineering* **Alec Tong** *Electrical Engineering*	**Exhale or Jail**	**Jennifer Ross** **Ken Hughes** *Electrical and Computer Engineering*
Kyle Ugale *Electrical Engineering*	**Elecronic Piano Team**	**Ken Hughes** *Electrical and Computer Engineering*

Mechanical Engineering:

Student Presenters	***Project Title***	***Faculty Mentor(s)***
Emanuel Abarca **Fahad Almenai** **Abdul Alshaiji** **Felix Maravillas**	**Automated Camera Track**	**Kyle Watson** *Mechanical Engineering*
Benjamin Aguilar **Oscar Gerstenberger** **Vincent Lavaroni** **Armand Matossian**	**Precision Analog Shower Knob**	**Kyle Watson** *Mechanical Engineering*
James Benefield **Joshua Dorris** **Michael Fischer** **Zoie Oberg**	**Miniature Wind Turbine**	**Kyle Watson** *Mechanical Engineering*
Hannah Bettencourt **Molly Bettencourt** **Joshua Tunquist** **Jeremy Wood**	**Adjustable Load-Bearing Leg Brace**	**Kyle Watson** *Mechanical Engineering*
Andrew Bose **Anthony Leonetti** **Kevin Leong** **Joshua Saltsman**	**Coupled Jet Engine Proof of Concept**	**Kyle Watson** *Mechanical Engineering*
Jordan Briggs **Austin Jarvis** **Stefan Soezeri** **Jonathan Wagenet**	**Rotary 3D Printer/Additive Lathe**	**Kyle Watson** *Mechanical Engineering*
Garret Close **Cameron Cornell** **Katy Liege** **Sean Ferguson**	**RC Car Optimized for Speed**	**Kyle Watson** *Mechanical Engineering*
Ranjot Dhaliwal **Kristena Moules** **Michael Nickel** **Scharlyce Powell**	**A Tire Lift Assist System (ATLAS)**	**Kyle Watson** *Mechanical Engineering*
Trevor Doom **Grace Hamann** **Daniel Lee** **Alex Walker**	**Hybrid Tricycle**	**Kyle Watson** *Mechanical Engineering*
Lee Graham **Matthew Mills** **Chris Pallios** **Grant Somerville**	**Pneumatically Assisted Arm**	**Kyle Watson** *Mechanical Engineering*
Maxwell Hallmark **Tony Nguyen** **Stephen Siu** **Henry Velasquez**	**Self-Spotting Bench Press Proof of Concept**	**Kyle Watson** *Mechanical Engineering*

May 10, 7 – 10

Faculty Mentor: Patti McCarthy

Student Filmmaker(s)	*Film Title*
Ceci Aguinaga *Exploratory* **Edward Fierros** *Exploratory* **Miguel Bucio** *Mechanical Engineering* **Raul Mondragon** *Spanish*	**Love**
Matthew Barnes *Theatre Arts*	**Saving Adelaide**
Matthew Barnes *Theatre Arts*	**Animalia**
Scott Carter *Psychology*	**The Monkey's Fist**
Scott Carter *Psychology*	**The Swap**
Kyle Chen *Business Administration*	**Maturity**
Jessie George *Self-Designed/Cross-Discipllinary* **Matthew Barnes** *Theatre Arts* **Eugene Kilbride** *Political Science/Pre-Law*	**O, Love**
Hentry Greenthal *Film Studies* **Jonathan Russo** *Film Studies*	**Isolate**
Hentry Greenthal *Film Studies*	**Murderer's Anonymous**
Estrella Heredia *Exploratory* **Lisa Nguyen** *Biological Scienceds* **Myhanh Nguyen** *Business Administration* **Mia Arostigui** *Visual Arts* **Brianna Gonzalez** *Sociology*	**Support**

Student Filmmaker(s)	***Film Title***
Sarah Kellner *Film Studies* **Brandon Ramirez** *Film Studies* **Kelly O'Moore** *Film Studies*	**Blood Money**
Sarah Kellner *Film Studies* **Brandon Ramirez** *Film Studies* **Kelly O'Moore** *Film Studies*	**Single in Cyberspace**
Sarah Kellner *Film Studies* **Brandon Ramirez** *Film Studies* **Kelly O'Moore** *Film Studies*	**Trapped Within**
Eugene Kilbride *Political Science/Pre-Law* **Jessie George** *Self-Designed/Cross-Disciplinary* **Ashley Yum** *Pre-Law*	**Freshman Fright Night**
Megan McVey *Film Studies*	**The Haunting**
Louie Palacios *Business* **Muhammad Khan** *Civil Engineergin* **Juan Giovany Zapata** *Exploratory* **Alondra Soto** *Psycology* **Nia Hall** *Relgious Studies*	**Impact**
Ashley Pham *English*	**The Quiet World**
Jenna Phinney *Communication* **Omar Sanchez** *Sociology* **Linda Nuguyn** *HESP* **Daisy Lopez** *Exploratory* **Stephanie Lopez** *Exploratory*	**Acceptance**

Student Film Showcase – Janet Leigh Theatre

Student Filmmaker(s)	***Film Title***
Brandon Ramirez *Film Studies* **Sarah Kellner** *Film Studies* **Kelly O'Moore** *Film Studies* **Jessie George** *Self-Designed/Cross-Disciplinary*	**On the Edge**
Robert Shibura *Business Administration*	**Young and Dumb**
Rachel Vanhorne *English* **Carlos Castellanos** *Political Science*	**Have a Nice Trip**
Rachel Vanhorne *English* **Ashley Yum** *Pre-Law* **Carlos Castellanos** *Political Science*	**Countdown**

Do Good Desgin

Margaret Brunet

Faculty Mentor: Brett DeBoer

With the growing need and desire to utilize technology in our daily lives, it is easy to loose track of how much time we spend behind a screen. It's unbeknownst to most of us that the amount of time we spend using our devices can actually be detrimental to our health.   In my project, I intend to raise awareness about the negative effects that screen time has on a person's day-to-day life, and the long-term developmental effects it has on children. I tried to make the information accessible to both children and parents through a campaign including an animation, an app, other paper collateral, and the friendly mascot Eddie the Eyeball. This project uncovered an important problem in our society, along with one great irony: In an attempt to warn people about excessive screen time, I found myself sitting behind a computer for 20+ hours working towards a solution. It was well worth the screen time because my project taught me that I want to always create designs that benefit others. Visual communication has an incredible influence on our society. So many people are quick to take the information that they see at face value, which grants graphic designers a lot of power in the information that is designed and released. The most important part of design is finding a worthy challenge, being passionate in pursuit of a solution, and above all, designing for good. After all, with great power comes great responsibility.

Identity Design

Jana Burkard

Faculty Mentor: Brett DeBoer

We live in a fast-paced world that constantly evolves. It renews itself so quickly that sometimes a blink of an eye is enough to fall behind, to miss out on the change that happens all around us. It is somewhat scary but it's also fascinating. There will always be more to discover, more to explore and to learn. Many years down the road you will probably still find yourself inspired by the most ordinary things like a poster on the subway, a book cover, someone's clothing or nature itself. We are able to read so much meaning into seemingly insignificant things. But the wrong choice of typeface or the color of a logo, using an outline, or adding more white space around a design can make a huge difference in how something is perceived. "Graphic design will save the world right after rock and roll does." — David Carson, which is why I chose to direct my focus for the senior project to branding and identity design. Unlike what most people think, a brand is neither a logo nor an identity. A brand is a gut feeling about a company or organization. What identity design does, is bridge the gap between the business strategy and the creative thinking behind the design. Identity design connects the analytical and logical ideas of the business with the emotional and intuitive ideas of the brand, which is what I tried to capture with the visual designs I created. My goal in creating visual identity is to communicate what the brand is about, and to create something that might spark that unexpected inspiration.

Experimental Letterpress

Jordan Capper

Faculty Mentor: Brett DeBoer

Jordan Capper Professor Brett DeBoer Artist Statement Design by hand, or by non-digital means, can easily be dismissed in design. Speed and the infinite number of options available through the digital process makes it easy to miss all of the subtleties that come from the physical effort associated with printing by hand. In this series, I have decided to combine the wealth of options that the digital medium provides with the physical touch still in tact. I started with wooden letterpress blocks that I had inked and made a miniature pattern. After this, I took photos and then placed them into Illustrator to extrapolate the patterns into a larger work. I also chose to make compositions that explore the instinctive centrifugal nature of printed form. This series also continues to explore a familiar territory to myself, which is creating hidden objects within a design. People will see different things within these explorations; sometimes it's not always about the intention of the artist, but what the viewer finds to be significant when it comes to familiar abstracted forms. In terms of philosophy, I chose to use this project as a means to explore a medium that I really enjoy to experiment with. It's my firm belief that focusing on what you love will lead to success. I hope to achieve this with not only this one project, but also for my future aspirations as an artist.

E. McKnight Kauffer Banner Series

Katie DeWitt

Faculty Mentor: Brett DeBoer

Katie DeWitt Professor Brett DeBoer Artist Statement E. McKnight Kauffer worked throughout the 1920's and 30's as an influential advertising poster designer. He is still recognized today for his innovative take on the world around him. Working with large clients like American Airlines and the London Underground, Kauffer transformed otherwise ordinary and boring design into modern, colorful and eye-catching advertisements. Rather than exploiting common forms of advertising such as, sex or power, Kauffer went for a more literal approach in his work. Taking the service or product and using it as a centerpiece proved to be very successful in Kauffer's design work.   I was first drawn to Kauffer after seeing one of his most famous pieces titled Flight. It features a collection of geometric birds "soaring to success" produced for an article for the Daily Herald. Each bird is made up of triangles and other jagged shapes but together it looks beautifully cohesive. Flight inspired me to create my first piece from this collection of posters then from there I chose five more of my favorite Kauffer pieces. With each of these Kauffer pieces I looked for an element that popped out to me the most, the one thing that forced me to look closer at the design. Then I took that element and interpreted it to fit my collection of posters. These posters are meant to honor the style and feel of Kauffer's work. While he designed in the 19th century, his work and influence is still just as relevant today. My posters are a reflection of the impact Kauffer has had on me as designer.


McKnight Kauffer

de Young | April 22, 2016 – July 11, 2016

de Young, Fine Arts Museums of San Francisco, 50 Hagiwara Tea Garden Dr, San Francisco, CA 94118. www.famsf.org. Artwork inspired by *Flight* 1919. Lithographic Estate of Edward McKnight Kauffer. Poster © FAMSF 2016. Designed by Katie DeWitt

The Art of the Zine

Ann Fitzpatrick

Faculty Mentor: Brett DeBoer

Have you ever sat down and just wanted to make something, right then and there? Well I do, and all the time too. Recently, I was introduced to the art form known as a "zine." A zine (pronounced ZEEN) is a self-published work, usually in the form of a booklet of some sort, which can be reproduced via photocopier. The beauty of a zine is that it can be whatever you want it to be. It can be two pages or twenty. It can be two inches tall or as large as you want. This is what I fell in love with. I fell in love with the freedom it offered. I fell in love with the immediacy of the process. I fell in love with the way I could throw it in the copier and watch it spit out fifty copies of my work, all of them identical.   I discovered that I wanted to make a zine that had the ability to engage with my audience in more interactive ways. I wanted to make a zine that would be engaging, customizable, and completely unique when finished. My goal was to prompt the audience to complete a series of creative tasks. While the tasks would be fairly simple, like coloring in a drawing or writing a short poem, each would encourage the audience to make creative choices. In the hands of each individual, each zine would become unique. Each a work of art. This zine is an example that illustrates the process and has shown me that when your audience is engaged, amazing things can happen.
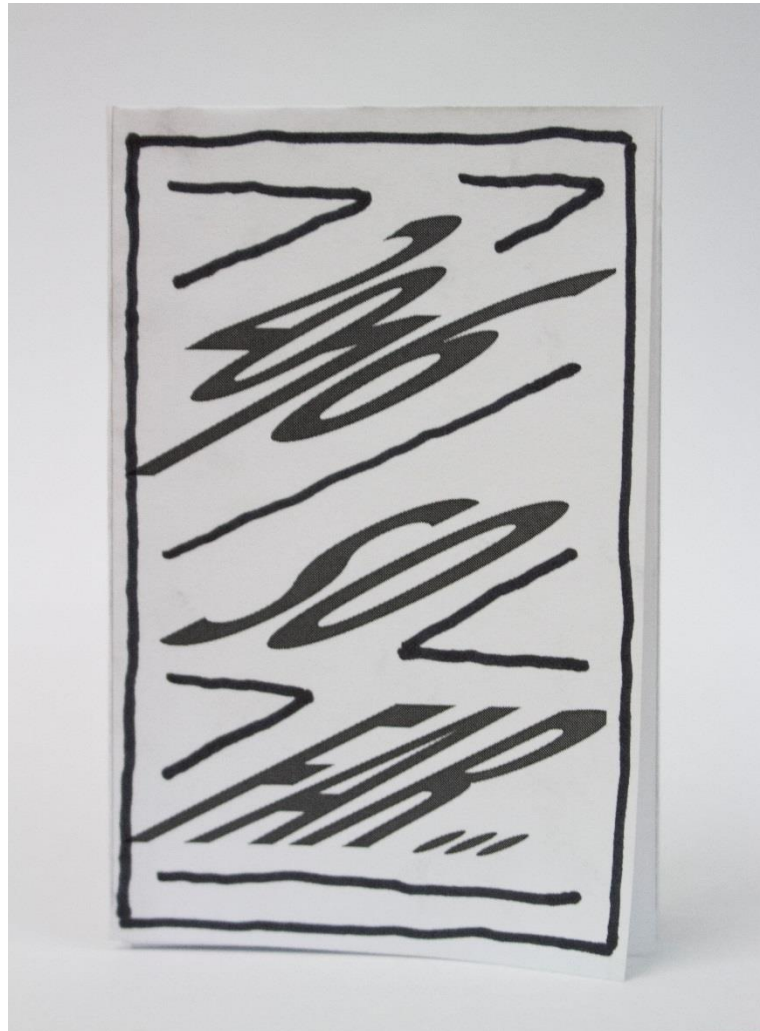
Got A Taste For Something Sweet

Marissa Lewis

Faculty Mentor: Brett DeBoer

Marissa Lewis Professor S. Brett DeBoer Artist Statement GOT A TASTE FOR SOMETHING SWEET? Everyone gets a craving for something sweet. Yet, sugar in any form can lead to metabolic diseases when excessively consumed in large amounts. Sugar is often a hidden ingredient in processed foods, so overall health will benefit most from limiting consumption of all sugars. This project has raised awareness of sugar's many forms and its influence on increased risk of metabolic diseases. The purpose is to inform our audience about choosing better alternatives for a healthier diet. Research has shown that there are not many continuous campaigns addressing the health concerns of added sugars. Added sugars are only mentioned in the ingredient list on food labels, and listed in decreasing weight order. Realizing this loophole, food companies take advantage by dividing sugars into three or four different sugar names, instead of just using one type. Placing these sugar names lower on the products' list makes us believe that the amount of sugar in the product is smaller than it actually is; ultimately resulting in the overconsumption of sugar. This is why it is important to know the other names for sugar listed on food labels. This project has persuaded the public to recognize exactly that. Success was measured by comparing results from pre- and post-surveys. Examples of visual means that have been used for effective visual communication are implementing design solutions, color theory, and informative graphic symbols. The results created a better understanding of poor-nutrient food products in order to help the target audience make healthier choices. Any form of sugar is harmful to the body when consumed in large amounts. What makes this project different is that it has targeted a University of the Pacific student audience by informing them of these health risks, and revealing the multiple names of added sugars. The ultimate goal is a healthier diet.
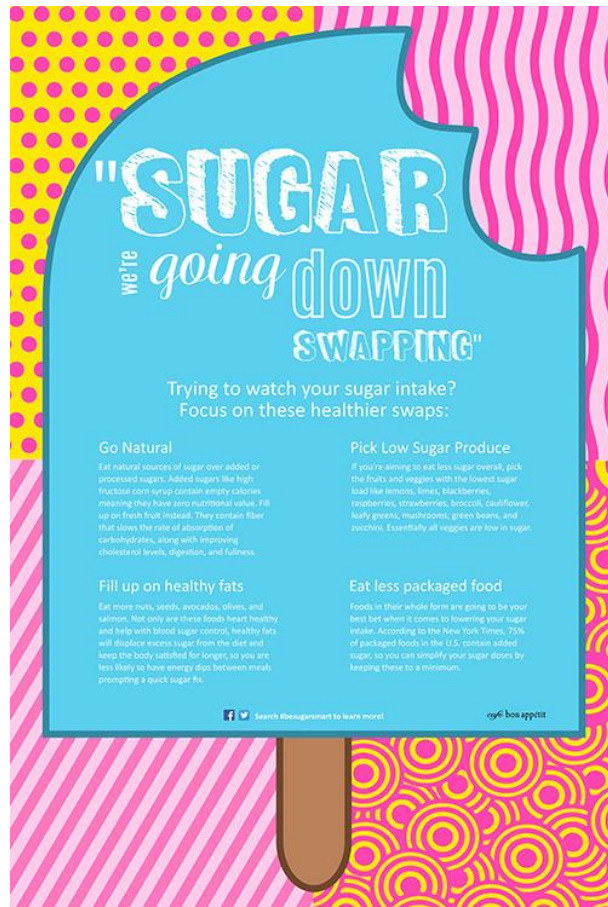
A Beautiful Mind

Dante Pasquini

Faculty Mentor: Brett DeBoer

¬Dante Pasquini Professor Brett DeBoer   A Beautiful Mind Charcoal on Paper Digital: Photoshop & Illustrator   The world we live in is a beautiful place. Around every corner there is something to admire, to appreciate. So why is there still so much sorrow, so much pain in the eyes of the people around me? I believe it's because of societies dishonesty to itself. We praise ourselves in quantity and not quality. The image. As a visual artist I've come to learn the power of an image, and I've also learned the control that we have over it. In order to control it, we must be able to control our mind.   Day in and day out, beautiful people suffer from an ill mind. We find ourselves trapped, failing to meet the 'expectations' of society. When in reality those 'expectations' come from within. We control the image of our reality. A beautiful mind is a visual representation of the classic theme "see no evil, hear no evil, speak no evil". I chose to work from the photos of a homeless man by Lee Jefferies as a reference because 'homeless' is the opposite of our societies expectations. There is evil in this world, but there is not evil in our minds unless you choose it to be so. The choice to see no evil, hear no evil, or speak no evil doesn't make you ignorant, it makes you beautiful.

**California Academy of Sciences
Poster Series**

Alec Shigeta

Faculty Mentor: Brett DeBoer

Alec Shigeta Professor Brett DeBoer Artist Statement Alec is a Senior Graphic Design Major at University of the Pacific. Design is subjective. Finding the right point to communicate what a client wants versus what they think they want is a difficult point of balance. I try to concentrate the essence of what is desired into a complete vision—working like an architect, starting with a framework, and filling in the spaces between, to create the optimal balance between creativity and practicality. This three-part piece is of a natural history museum's exhibit advertisement banners that are placed on street light posts. Each banner has an animal representing the theme of the exhibit, and each animal is made up of smaller animals, implying the depth of the exhibit in the amount of its content, into a tight focused visual representation. The simple design outside of the main imagery allows the visuals to do the talking, and be embellished by the text, to communicate what the museum's visitors are to expect.
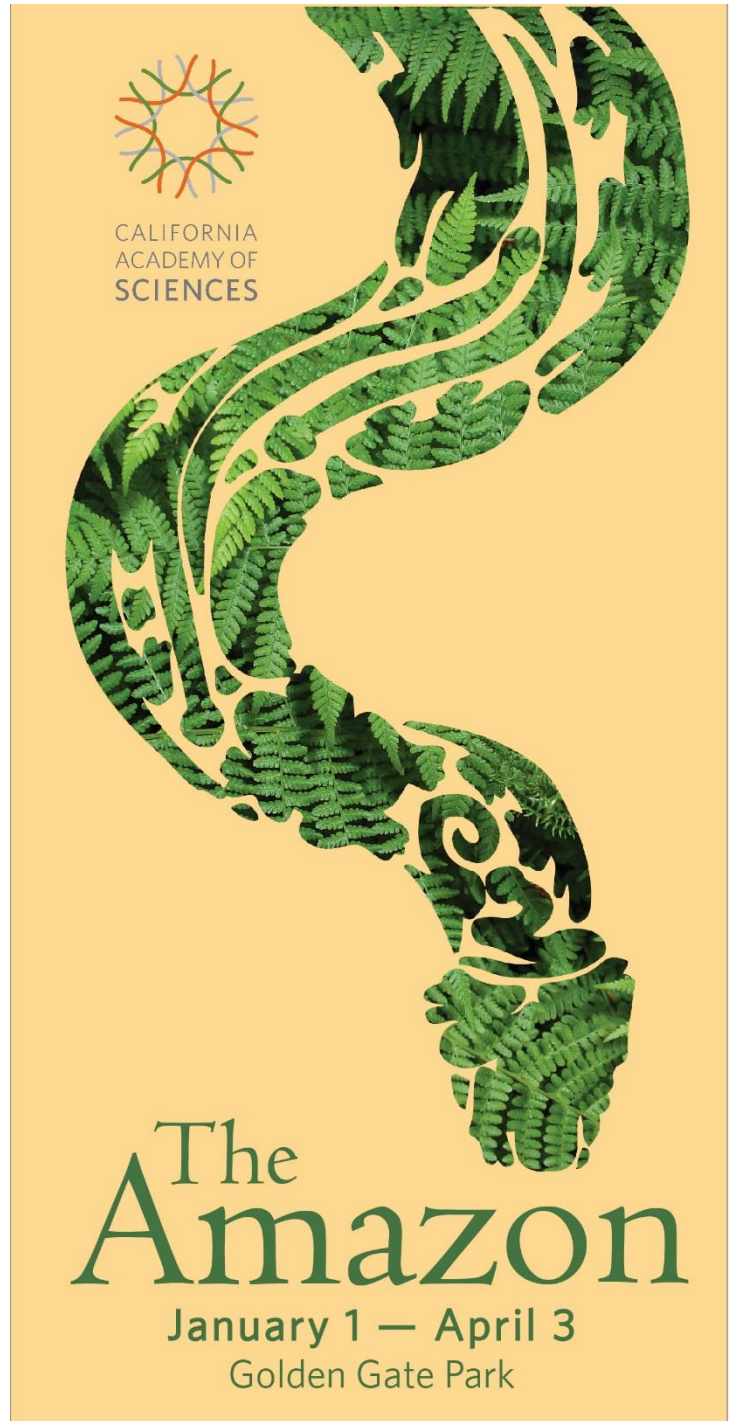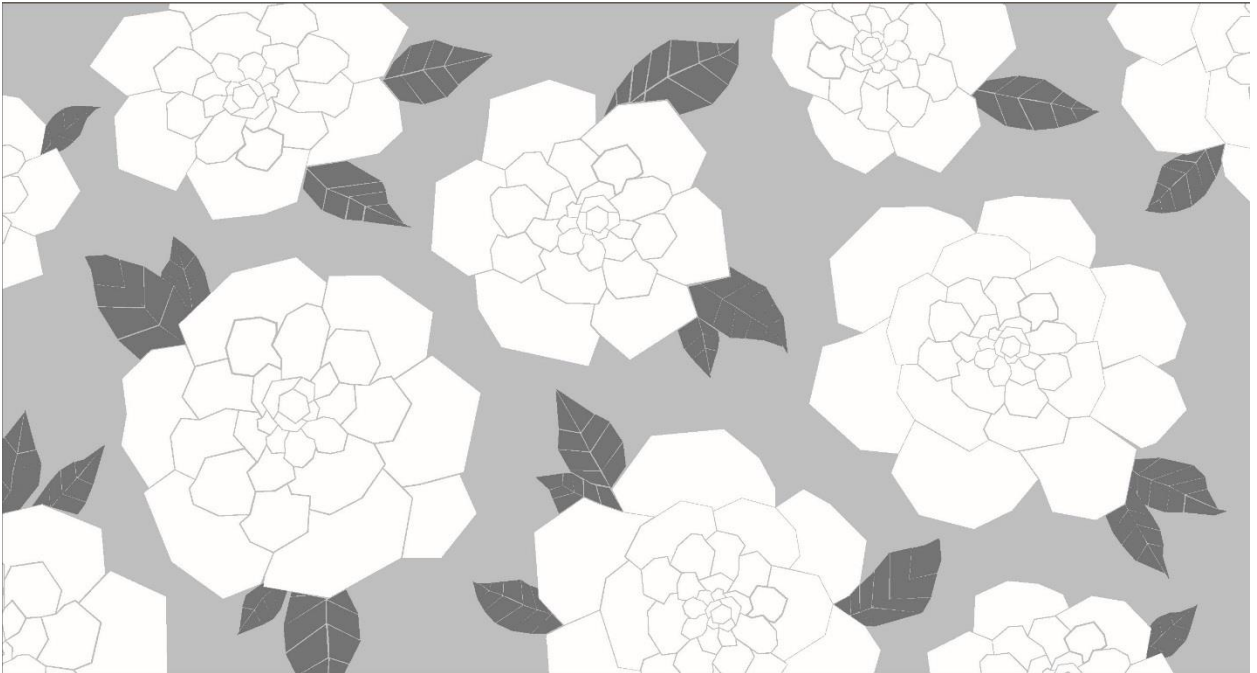
Event Design

Kristi Tom

Faculty Mentor: Brett DeBoer

Kristi Tom Professor Brett DeBoer Artist Statement Design should let your eyes breathe. If I could put my style into words I would say bright colors, open space, minimalistic. I have a contemporary approach to simplified modernist design that is reflected in a lot of my work.   I have always been attracted to event design and was looking for a way to incorporate this with my love for graphic design. My senior project is a mock wedding, which includes the table setting, invitations, and custom wine label. Although my designs are minimalistic and geometric, I hope to capture the love and togetherness that is the essence of all weddings.

Glimpses of Femininity

Daniella Arostigui Cabrera

Faculty Mentor: Monika Meler

"When looking at art, we must use our eyes. We must look, and go on looking till we have certainly seen exactly what is there. We sit down before the picture in order to have something done to us, not that we may do things with it. The first demand any work of any art makes upon us is surrender. Look. Listen. Receive. Get yourself out of the way. (There is no good asking first whether the work before you deserves such a surrender, for until you have surrendered you cannot possibly find out.)"--C.S. Lewis

I look around and feel as though the world moves too quickly. I feel everything is passing by at the speed of light yet no one catches a glimpse of it before it vanishes. I always wanted to help people see and think more deeply. I am an incessant thinker. No thought will go un-thought of and nothing will go unanalyzed.

Drawing has helped fuel my love for thinking and observing as I get to analyze everything to ensure I recreate it properly. C.S. Lewis's idea that one must surrender to the sights around them resonates with me because I feel that surrendering to what you see should begin with the world, not just in art. I primarily draw realistic portraits, but I do not find them beautiful just because of the features the figures have. I find beauty in the thorough observation of the human face and the possibility of conveying almost any inner feeling with just small shadows and lines. The world we live in should have our eyes surrender to it first, then art can reach people on a deeper level.

Headache Face, Self Portrait

Approximately 14"x17"

Graphite

2015

Challenged Perspectives

Andrew Ciminelli

Faculty Mentors: Daniel Kasser, Monika Meler

My art is about the use of multiple perspectives, or the ideas of cubism. Cubism attempts to recreate an environment in a way that is divided by angles, geometric planes and changing the direction a subject is viewed from. Photographing an area with a cubist approach allows me to interpret the space in my own manor, while maintaining the most of the natural aesthetics. When the image is viewed in it's entirety, the photo represents a real space. My interpretation of the cubist method allows me to abstract the area and produce sections based on spacial planes. Each plane is a portrayal of the environment from a different perspective. These planes are based on a person turning their head side to side, plus up and down, to view the space with their body in a single location relative to the subject matter.   My works attempt to challenge things that are generally assumed about the environment we live in. The interacting planes of my photographs create abstractions of realities that would not be typically questioned. The ability of my work to question what is real and what is not real with the utilization of cubist concepts provides a unique experience of the photographed environment.

Bassi Falls 6.jpg

sac cubism 15.1.jpg

Wiskeytown Creek Ditch Trail 3.jpg

Wiskeytown Falls 2.jpg

Wiskeytown Road trip.jpg

Portfolio

YiFei Di

Faculty Mentors: Monika Meler, Lucinda Kasser

Out of interest, I have been studying art since I was still a child. The form of art that I like best is painting. I began to learn drawing, painting and Chinese traditional painting when I was a pupil. Then, the love of painting pushed me to study in an Art High School in my hometown. The educational experience in this school has shaped my art quality. The constant practice and the guidance from teachers helped me learn the application of lines and color schemes. Moreover, the school life taught me the importance of persistence and concentration. After graduating, the things I learned from this school have been my driving force to improve myself. Now, the color I use in the oil painting can express my feelings and the lines I use in sketches can display my skills. This educational experience is so crucial that it has already the cornerstone of my pursuit of art


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Soto Surreal

Joe Soto Jr.

Faculty Mentor: Monika Meler

At the age of five when I was first learning to hold a pencil, my kindergarten teacher asked the class to draw a tree log. I was the only kid to correctly draw the log in the 3 dimensional. It might seem insignificant, but it was a huge moment in my life and the reason I was destined to be an artist. The first time I saw Roger Dean's, Tales of the Topographic Oceans, was when I first knew what kind of art I would aspire to create from then on. The artists that have inspired me are Roger Dean for his surrealism, Norman Rockwell for his attention to detail and humor, Tom Hattan from the Family Film Festival every Saturday morning for his cartooning, and many artist from the Renaissance for their dedication. The surreal is the most fascinating type of art for me. I love the "dream state" where everything looks real but doesn't necessarily make sense, yet is part of a narrative nonetheless. Surrealism lends itself to spontaneity. I often times document my dreams before they are forgotten as they are surreal in nature and a great source for inspiration and ideas. I enjoy creating art that doesn't give away its secrets all at once. I might insert a hidden date, add a touch of color where it doesn't belong but seems to works, or add a certain detail that only gets noticed much later. Nothing is more gratifying than someone appreciating everything that I put into a piece. My aim is to reward and keep the viewer's eye entertained for as long as possible. Without the viewer, creating art would not be gratifying nor worth producing. To be an artist, the ultimate payoff is to share.
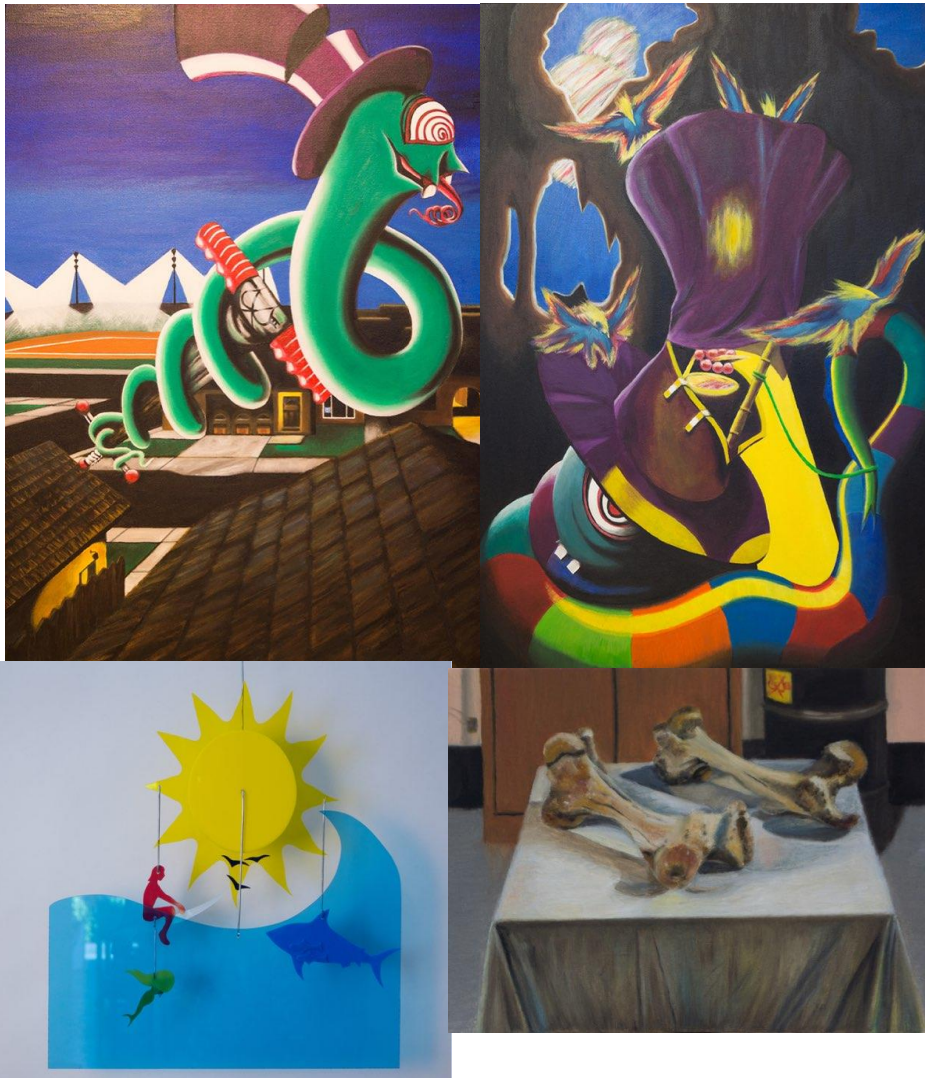
A Picture is Worth a Thousand Words

Jiachun Wang

Faculty Mentors: Monika Meler, Lucinda Kasser, Daniel Kasser

 "A picture is worth a thousand words. " Instead of talking or hanging out with people, while I am painting or sculpting my whole world is surrounded by complete peacefulness, which is able to provide unimaginable influence on my daily life. Admittedly, art is my best language. Making art, that indicating a human being is generally able to get variable resources from the vast universe, tend to representative my personal observation on environmental nature. In addition, art had also changed my personality. Back to the time I had no connection to the region of art, I felt everything was indifferent toward me. However, along with building up the abilities in drawing and painting I have been trying to learn how to observe this magnificent world by making art relate to environmental nature. There is a well-known artist I admire, Antoni Gaudi, a Spanish architect who had made organic work reflecting his personal opinions on the natural forms. His impressive artworks are able to show me how shapes are different and incredible this world is from what I have seen and encouraged me to consider the world around me for inspiration. To convey and exhibit my portfolio to my viewers I expect people to be affected by my personal understanding toward the nature, and furthermore, toward the whole world in my eyes which I had already putted in between of my works. I want my viewers to see my works so they can receive a message from me. Thus since I get started to enjoy capturing the beauty of what a blink of an eye can share, I am fully able to recognize that my passion toward art has grown throughout my daily life.
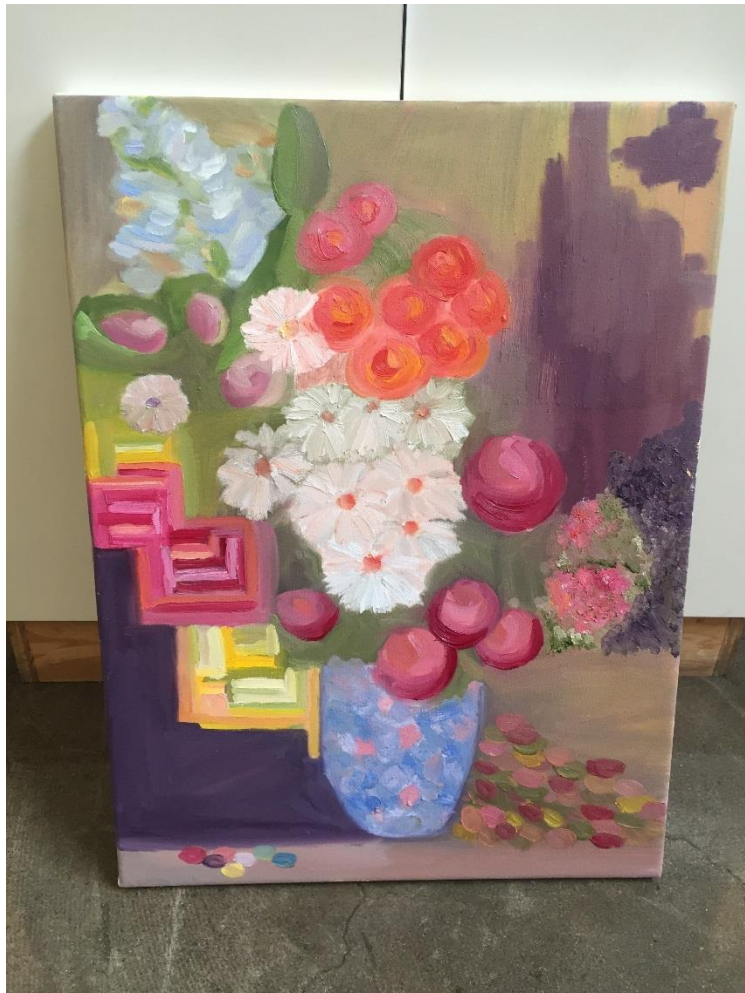
Reflections on Shalom

Anneka Weinert

Faculty Mentors: Monika Meler, Lucinda Kasser

The Hebrew word שלום (shalom), generally translated as "peace", encompasses a far more holistic idea than our simple English word contains. Shalom is derived from a root that denotes completion and wholeness, and is commonly tied to the notion of perfection throughout Jewish literature.   As a follower of Jesus, my art cannot help but intersect with my faith. The notion of shalom is tied up in my life, art, and faith because it is something so central to God's heart and character. In my artwork, the theme of shalom (as it was created, has been broken, and is being restored) threads through everything I do. My introspective work explores my own brokenness and tells my small part of the larger story of redemption that God is weaving. This series of mixed media/collage work presents a piece of an ongoing conversation between myself and God, depicted through garden imagery as he leads me from a state of self-sufficient drought to a place of dependent flourishing. The imagery I chose to use in this series flowed from scripture and prayer, and is such a very personal series. To broaden the audience and include the viewer in the story, each piece started with a mirror. The reflections this weaves into each piece draw in the viewer, and help them to see themselves in my journey and the larger story of redemption.

San Francisco Afterhours

Ray Wong

Faculty Mentor: Monika Meler

San Francisco can be described in many ways. During the day, the city becomes busy, noisy and packed full of tourists. Usually it's like that when you are coming to the city during the day but at night, the city starts to become different. From the afternoon towards sunset, San Francisco gets darker, quieter, and fewer tourists are crowding around certain landmarks. The city becomes alive at night. With this photographic series, I set my goals to be able to learn new skills, becoming creative with various compositions and to portray a series to make a city feel alive. I took up this project as a learning experience since I wanted to explore more into a traditional style of photographing a landscape or a certain site. Long exposure photography is still being used today since it is able gain a lot of information and details within each shot. I also attempt to take panoramic photographs to give the viewer a sense the wide and large areas in San Francisco. I want my photographs to portray a sense of life and within a busy city like San Francisco. Some of these photographs involve different color lights streaming through intersections and people being blurred in the shots. Those interruptions give the photographs a sense of movement in the composition. I can't ignore the traffic or the crowded areas since it is a part of what San Francisco is. The panoramic shots give out the idea as if you are at the location of where I took the photos. Overall, this project makes me experience a new lifestyle within the city during the night. I was able to adapt into different conditions at the same locations and compose new elements in my photographs.

Effectiveness of Telecommuting Managers and Managing Telecommuters

Brian Estes

Faculty Mentor: Qingwen Dong

Graduate Student Mentor:

This research was performed to understand how telecommuting managers and managing telecommuters is carried out. It explored the benefits and challenges as well as offers some insight into performing effectively and efficiently with communication methods as a main focus.

Work-Life Balance: The Benefits and Challenges It Poses on Men

Luis Reyes

Faculty Mentor: Qingwen Dong

Graduate Student Mentor:

I examined ten working male subjects that hold full time jobs with children and a spouse at home. The study focused on the relationship between work life balance and the effects on family dynamics for working males. Using a questionnaire, research found that the male subjects continue to struggle with work life balance and are aware of the affects it is causing in the family dynamics. The working male subjects realized that an imbalanced work life would cause greater issues in the future with their family. The study found there are obstacles that are preventing males from having an effective work life balance both at home and at the work place that need to be addressed.

Is Trust Critical Between Social Identity and Job Satisfaction

Monique White

Faculty Mentor: Qingwen Dong

This paper introduces a concept of trust and whether or not it is linked to social identity and job satisfaction in organizations. Trust has been studied by many researchers as a relationship concept; however, its conceptualization is dependent upon the various perspectives of disciplinary lenses. For this research, trust is conceptualized as a belief that someone or something is reliable, good, honest, and effective; furthermore, for the purposes of this literature review, an institutional-based construct for trust will be the focus. To be specific, the institutional-based construct of trust is conceptualized as one who believes the needed conditions are in place to enable one to anticipate a successful outcome in an endeavor or aspect of one's lie. The paper elaborates on the psychological, relational, and institutional based construct of trust. It then discusses how perceptions of organizational politics are very important aspects of organizational life with respect to its members as trust is influenced because of various processes which ultimately affect performance of employees. The research was conducted through a qualitative methodological approach to study trust as it relates to social identity and job satisfaction. The findings are based on interviews that support the hypothesis that trust and social support are good moderators of the relationship between social identity, perceived organizational politics and job satisfaction (Vigoda-Gadot & Talmund, 2010). Therefore, the purpose of this study is to obtain a deeper understanding of whether or not trust is a critical link between social identity affected by psychological contract breaches (lying) resulting from perceived organizational politics and job satisfaction.

Social Media and Organizational Transparency: A Case Study of McDonalds' Customer Engagement Campaign

Gitaine Reis

Faculty Mentor: Heather Hether

2015 Pacific Fund Summer Undergraduate Research Fellowship Project

Social media is a tool that has innovated the field of public relations. This platform provides an ideal channel to engage key publics through communication strategies that rely on organizational transparency and dialogic communication. Through focus groups, this study examined whether McDonalds' "Our Food. Your Questions" campaign made a positive impact on consumer perceptions of their food and organization. Findings reveal the

campaign had an uneven impact across consumer perceptions; however, all participants acknowledged that they appreciated the campaign's overall strategies. This research contributes to and extends current understanding of the best practices and innovation of organizational transparency on social media and suggests that using social media to facilitate organizational transparency and dialogue is a worthwhile public relations endeavor.

Under the Covers: The Production of an A Cappella Cover Album

Cecilia Salinas

Faculty Mentor: Keith Hatschek

Since the release of Pitch Perfect in 2012, collegiate a cappella has become a more prevalent part of popular culture. But what actually goes into producing an album of a cappella cover songs? As a founding member and current president of the Pacific Stocktones, the only student-run a cappella group at Pacific, I decided to delve further into how a studio-recorded EP is licensed, recorded, edited, mixed, and produced with the added challenge of working with an ensemble of 21 busy college students. After two semesters of leading the group through the recording and mixing process, we are finally ready to release the final product – our self-titled EP. My paper is a reflection of the entire production process of the EP from the perspective of an executive producer and manager of the ensemble. The presentation will overview all of the steps taken to produce the album and legally distribute it to our target audience, as well as uncover the obstacles we faced and overcame along the way. The end of the presentation will also feature an exclusive sneak peek of one of the tracks off our album!

Don't Look Back! A Eurydice Retrospective

Madelaine Matej

Faculty Mentor: James Haffner

The Greek myth of Orpheus and Eurydice was the basis for two of the earliest operas circa 1600 and has since appeared in seventy-nine operatic works. Because the story focuses on the power of music, many scholars have analyzed how the musical content of the operas represents the story's themes and its leading male character, Orpheus. Eurydice, the leading female, has been ignored. Alexandra Amati-Camperi revealed this oversight in her 2008 article "The First Operatic Women," which analyzes the first three operatic settings. She theorizes that Eurydice "set the standard for the feminine voice in opera" and for character traits of the leading lady as well as that composer Monteverdi started the tradition of killing sopranos by silencing all three female characters of his setting.

I embarked on a survey of the Orpheus and Eurydice operas written between 1600 and 2000, narrowing down the seventy-nine operas to fourteen. I looked at libretti (or what Eurydice says), the quantity of music for Eurydice, how early she dies, and her relationships with other characters. When possible, I also used music analysis to add information about her character and her importance.

I concluded that Eurydice has not come far in 400 years. Her most powerful form was in Luigi Rossi's *Orfeo* of 1647, considering she avenged her own death and had no need of Orpheus. Moreover, Eurydice fits the "eternal feminine" archetype in the philosophy of gender essentialism. She is a passive, ideal female whose sole purpose in the story is to inspire her husband to produce greater art. I suggest that Eurydice sets the standard for the operatic leading lady to be an eternal feminine. However, other female archetypes appear as well, some of them stronger. Librettists and composers have the power to shape the history of female characters in opera.

An Unhappy Union: The Rise and Fall of Dual Conducting

Kimberly Contreras

Faculty Mentor: Sarah Waltz

Observers of modern ensembles and their practices would be surprised to learn that the conductor has not always been the sole leader of the ensemble. In the eighteenth century, the common practice for orchestras (including opera orchestras) was "Dual Conducting"; this was the practice of dividing the leadership of the orchestra between the keyboardist (Kapellmeister) and the first violin player (Konzertmeister or concertmaster). A relevant question, then, is how can one keyboard (harpsichord) player, that can barely be heard over the sound of the orchestra, be in charge of keeping the tempo for at least 15 musicians? Although the secondary literature is thin on this area, there are enough translated primary sources to enable one to track this technique through different European countries and determine a timeline for how the baton conductor developed in each country, which has not been clarified in the standard literature in the field. (Misconceptions abound.) Some preliminary findings showed that the baton was originating in France, as the earliest uses of the device, and that the idea was spread throughout Europe, each country adapting to the new form at different paces. This paper will discuss audible time beating practices, problems of dual conducting, including pros and cons of both the violin and keyboard conductor, and explain how the baton and podium for a single conductor came into common use for ensemble leaders throughout Europe. I am hoping to touch other musicians and contribute to our history on a subject that has had little research done on it and is, in my opinion, very relevant to our profession. I hope that this will help others understand how conducting developed from an obtrusive annoyance to a beautiful and seemingly elegant form of expression.

Effects of World War I on British Women Composers

Sarah Jordan

Faculty Mentor: Sarah Waltz

World War I was a harsh and trying time emotionally and physically for the English people, whether the individual was in the battlefield or supporting the war effort at home. Although, obviously war always brings dramatic change, for England the Great War was extreme because with modern warfare and weaponry the violence involved every man, woman, and child; this was the first time in modern history that this occurred. Music was drastically changed because of the war. Obviously many musicians were called to the front lines, so productivity declined; many of those musicians never returned. Those who remained behind were often out of work due to concert halls closing; less money and access to performing and educational materials; more foreign influences including refugee musicians; and a new demand for lighter, less serious genres of music. Though there are many studies on music during this time, there is very little study on how this affected women composers. After conducting research on the general effects of the Great War on women's issues (such as suffrage, employment, civil rights, and domestic roles) and exploring the lives and works of these women composers, it is my hope to shed some light on this relatively small subgroup of musicians. This paper will discuss social changes for women in England during the Great War, then focus on the changes that occurred effected musicians, particularly women. After, I will introduce four case studies of women composers: Ethyl Smyth, Rebecca Clarke, Muriel Herbert, and Liza Lehmann. Their lives from 1910 - 1920 will be compared and contrasted. Preliminary results indicate that other career and social aspects affected these women's careers more than the war did, which was not true for male composers during the same period.

The Story of the Storyteller: The Real Story in Rimsky-Korsakov's Scheherazade

Nathaniel Pergamit

Faculty Mentor: Sarah Waltz

Nicolai Rimsky-Korsakov's symphonic suite Scheherazade, based on the classic tale A Thousand and One Nights, is a work known for its virtuosity, beauty, and vibrant storytelling. It is a crowd favorite and is often programmed for symphonic concerts. Yet how does the audience know which stories from A Thousand and One Nights are being told? While the story can be written in a program, does the music hold up on its own? As the titles were given after the piece was written, many musicians have debated whether or not the stories are actually being told, or if any piece of music could tell a story. Did music even need to tell a story? Some musicians, like Johannes Brahms, should simply exist for its own sake. Richard Wagner argued that all music should be narratives that tell fantastic stories. This is still a highly debated topic among musicologists. I knew that there must be an answer to these questions. Through careful score study, analysis of the source materials and scholarly writings I have come to a conclusion: Not only are the stories well supported by the music, but that there is an even larger story that is being told: the story of Scheherazade herself. Rimsky-Korsakov was a master of writing programmatic music and orchestration, so it stands to reason that he was capable of having a unique perspective on the stories and how they should be told. The composer creates a compelling narrative through use of melody, harmony, form, and orchestration. Each movement uniquely presents its themes and contributes to the overarching story. His techniques prove that it is possible to to tell these kinds of stories through music. Come join me on a journey, as I shine light on the masterful techniques used to tell not just one, but five vastly different and unique stories.

Assessing the Importance of Infrastructure in Emerging Economies: A Cross-Country Study of Infrastructure and Income Inequality

Courtney Bye

Faculty Mentor: William Herrin

Infrastructure is an integral aspect of a country's development and may be used as an indicator of current and future economic success. In this paper, I investigate the relationship between the coverage of various equipment and structures that comprise a country's infrastructure and GINI coefficients across countries. The GINI coefficient measures countries' income inequality. My goal is to gauge if inequality can be explained by differences in infrastructure across countries. I use data from the World Bank, Infrastructure and Economy & Growth topics database. A multivariate regression analysis will be used to measure the relationship between GINI coefficients and infrastructure coverage across countries. I anticipate the findings to show a negative, linear relationship between the variables indicating as infrastructure coverage in a developing country increases, its GINI coefficient ought to decrease, showing movement towards a more equal dispersion of income. This result should occur as more individuals, especially rural residents, have access to structures and transportation which lead to additional income generating opportunities not available beforehand. Additionally, I will investigate the presence of non-linear relationships between infrastructure and GINI coefficients. Following the theory of immiserizing growth, or the theory that economic growth may hurt the developing countries rather than help, I will question if there is a point in emerging economies development where there may be too much infrastructure. If this occurs, I anticipate it to be much like a function of diminishing marginal returns, where additional infrastructure metrics may result in no change or an increase in the GINI coefficient as there may not be enough human capital available to allow it to impact the country's dispersion of opportunities and income

Housing Prices and The Gini Index

Sandra Mendez

Faculty Mentor: William Herrin

Abstract This research paper will develop a regression model and analyze the relationship between the dependent variable, housing prices, and the explanatory variables: crime levels, education, income, income inequality, and racial/ethnic population. Data will be collected using metropolitan areas in the United States over a five year span. The dependent variable represents the median house price in a metropolitan area per year and will be measured in thousands of dollars. Crime levels will be measured as two distinct variables: violent crimes and property crimes. Both will be measured in terms of the rate of crime per hundred-thousandth person per year in a given metropolitan area. Education represents the total funding a metropolitan area gets resourced per student per year. Income represents the median household income within a metropolitan area over median household size per year measured in thousands of dollars. Income inequality represents the gap between household income measured as a value between 0 and 1, the gini index, in a metropolitan area per year. Racial/ ethnic makeup is broken down into Hispanic, Asian/ Pacific Islander, African American, Native American, and White or European descent, all of which will be measured as a percentage of population in a metropolitan area per year. It is expected that the estimated coefficient for crime levels, racial/ethnic population, and income inequality will be negative and for education and income, the sign will be positive. The regression analysis will interpret the coefficients and test for the strength of influence using a separate equation; furthermore, important components of the regression will also be explored. The goal of this regression is to understand how the explanatory variables influence the changes that occur in house prices, how they are related to each other, and the how income inequality plays a role.

Vape Culture Among Young People

Rob Mees

Faculty Mentor: Ruth Lewis

Recent years have seen a rapid rise in the use of electronic cigarettes (e-cigarettes), especially among teens and young adults, including a significant minority who have never smoked 'traditional' cigarettes. Response to this surging use has so far been mixed, with popular claims about e-cigarettes' health benefits as a smoking cessation tool pitted against growing concern about new 'gateways' to nicotine dependence among young non-smokers, and the 'renormalization' of smoking behavior. In January 2015, California Public Health Department called for a major campaign to educate young Californians about e-cigarettes. The effectiveness of such a campaign requires nuanced understanding of the meanings and use of e-cigarettes (popularly known as 'vaping') among this group, yet detailed knowledge is lacking.

Our in-progress study explores vape culture among young people aged 18-22 in Stockton. Our proposed presentation would report initial findings from at least three focus group discussions with self-identified "casual" and " committed" vapers. Including Pacific students, Delta students, and those not engaged in higher education. Major themes that will be highlighted include the varied appeals of vaping, the characterization of vape culture as a "community", and the social acceptance and restraints experienced by vapers.

Cultural Posturing and Religious Assimilation

Oula Miqbel

Faculty Mentor: Eleanor Wittrup

The purpose of this project is to show how "new-aged" Muslim women continue to wear the religious headscarf (hijab), but have began dressing more westernized, as an aim to make the hijab a more fashion forward accessory, rather than a religious emblem. From this project I will aim to find out what has motivated young women to take on these new trends and how their environments affect their decision. I will also attempt to uncover if there is a political aspect to the new trend, in addition to it being a social movement. I think that this project is important to offer some understanding about the nature and background of social movements such as the "mipsterz" (Muslim hipsters), and the new "hijabi" movement have flourished, in an attempt to establish whether or not these movements are a form of cultural relativism, appropriation, or assimilation into western society as Muslim hijab wearers navigate their roles in society.

Formation

Natasha Popowich

Faculty Mentor: Cynthia Dobbs

Within popular culture there has been a growing segment of "musical activism," in which popular artists have used their status, position, and music to address issues within their immediate society. In doing so, they communicate these problems to society at large and begin a discussion that can lead to acknowledgment and possible change, while simultaneously causing controversy in ways that some would find unimaginable. This project aims to establish an in-depth analysis that focuses on the growing usage of music as a platform for artists to work as activists. In particular, African-Americans have been using media to respond to the large amount of violence towards African-American males by police officers through movements such as Black Lives

Matter and Black Excellence (a movement aimed at highlighting the success of African Americans to counter-act the negative stereotype often portrayed). In order to better focus this concept and understand how music and media have combined to create a far-reaching platform for political issues, I will hone in on the impact of Beyonce's latest single "Formation." The song through the messages broadcasted in its lyrics and music video created an impact in New Orleans where that music video was shot, the segment of the American population that mostly identify with it, and a widely-publicized controversy that led to backlash from popular media outlets and police protesting her concerts. In total, this project will also look at the overarching question of what is the proper role of art in society. Should it be meant for strictly entertainment or should it be used to make a difference? If so, is there a limited space for whom should be able to create such art and a limited amount of topics that art can be created around?

Reflection of 1950's Society Through Fashion

Sarah Unger

Faculty Mentor: Kris Alexanderson

This project will be focusing on women's fashion trends within America in the 1950's and what influenced those trends. It will discuss what society was like before and after World War II and what women's place was within society and how they were perceived. On what is meant by the phrase "the American Dream" and how peer pressure and conformity shaped the American Dream and the lives of women. It will go into depth on the expectations verses realities of women's lives along with how different medias took part in the shaping of the lives of women. Women were the consumers that advertisements were geared toward and started taking a large role in directing fashion trends. With a deeper discussion on how fashion trends of the 1950's reflects not just what was in style at the time but the problems of the time period such as gender, social, and economic issues.

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From Page to Stage: How Performance Illuminates Gender Dynamics in Shakespearean Plays

Kathryn Harlan-Gran

Faculty Mentor: Courtney Lehmann

Although there are elements of Shakespeare's works that inarguably adhere to the expectations of the strictly patriarchal society in which he lived, other facets of his writing represent a remarkably progressive attitude toward gender dynamics. This is perhaps most evident in Twelfth Night, which intentionally breaches typical boundaries of class, erotic desire, and gendered behavior. By contrast, Much Ado About Nothing maintains more typical structures of gender roles and dynamics, yet it is distinctive in that Hero, an exemplary model of feminine behavior, is repeatedly punished in spite of her virtue, while her outspoken and independent cousin Beatrice is ultimately rewarded. However, in understanding theater as a literary genre it is important to note that performance can be as important as written text, if not more so. The novel theatrical interpretations of the Oregon Shakespeare Company are an ideal representation of the remarkable malleability of Shakespearean works, taking advantage of details such as casting, blocking, and delivery to illuminate dimensions of the text that may not be immediately discernible on paper. In 2014 the company staged a rendition of Two Gentlemen of Verona with an entirely female cast, and a few years prior Julius Caesar was cast as a woman. Though their 2015 performance of Much Ado About Nothing did not play so openly with cross-gender casting, it was remarkable in its ability to underscore gendered transgressions and to emphasize tensions that might be easily glossed over in written form. Similarly, their staging of Twelfth Night during the 2016 season highlights the potential fluidity of gender and brings homoerotic tensions to the forefront, emphasizing the intricate interrelationships between perceptions of gender and understandings of sexuality.

Feminism in Engineering

Alisha Rodriguez

Faculty Mentor: Jeffrey Hole

While the field of engineering is often given credit for creating innovative new technologies and contributing to what many consider to be social, historical, and economic "progress," engineering as a discipline is not innocent of producing and perpetuating the material and structural realities that work against women and minorities. From the entanglements of early engineering with the war machine and state military power, to more recent engineering feats involving computer programming and sexist video games, engineers have fallen victim to societal norms and expectations. The intent of this research is to unveil the connection between the stereotypes of women in our society and how they have impacted the field of engineering. Drawing on the works of Henry Petroski, Anita Sarkeesian, Simone de Beauvoir, and Judith Butler, among others, I focus on the concepts of feminism and how the early as well as current entanglements of engineering have created a barrier between women and their full participation in this field. In my paper and slide presentation, I examine how society has kept women out of engineering fields, and I make a case for how feminist theory can combat the inequality that exists in the profession today.

Analyzing Angel's Egg

Domenic Suntrapak

Faculty Mentor: Jeffery Hole

In 1985, young animator Mamoru Oshii began an ambitious project to bridge surrealism and animation. In collaboration with the renowned artist Yoshitaka Amano, Oshii succeeded in creating Angel's Egg, which would stand as the first of many experimental animated features to come. The original video animation film presents a vibrant and dynamic landscape, accented by sparse dialogue and richly ambiguous symbolism. However, as innovative as the film was at the time of its inception, its avant garde nature fared poorly with critics, and today only a

handful of hard copies still exist in market circulation. The elaborate animation and ambiguous storytelling present in Angel's Egg would not be seen again until three years later with the release of Katsuhiro Otomo's Akira in 1988, which captivated audiences and critics around the world. Today there is still little to no criticism written on the earlier Angel's Egg. My research evaluates why this particular work was passed over on the timeline of development in avant garde animation, and I draw attention to how the significantly dark color palette, the rhythm in which the story is presented, and music arrangement leave the initial viewer feeling ajar and dismissive of the film. Upon closer inspection, I argue, the film presents an intense discussion of human faith, memory, and consciousness. The film also reveals a unique circular narrative the likes of which hasn't been seen in animation since. In the aftermath of Angel's Egg, I show, most future avant garde works began to adhere to more concrete, albeit skeletal plot devices to maintain the intrigue and attention of filmgoers. Ultimately, I aim to raise awareness of this work by providing analysis and scholarly conjecture on an art piece that has lain dormant for far too long.

Turning a Blind Eye: Hollywood's Colonialist Framing of Human Trafficking

Jodi Tai

Faculty Mentor: Jeffrey Becker

The purpose of this paper is to explore common themes in the way victims, villains, and heroes are depicted in Hollywood, and how those themes may reflect society's both misinformed and discriminatory perception of others when it comes to human trafficking. For the purposes of examining these perceptions according to American society, this project will draw its support from American entertainment films. Specifically, (excluding documentaries) this paper will draw from fictive or biographical films on narratives about human trafficking that are directed or produced by American directors or screenwriters, or distributed by American film companies. By observing threads of commonality between these films, this paper endeavors to identify and critically analyze popular themes about human trafficking movies. Evidence drawn from this research supports that American movies about human trafficking often vilify those from the East and commend heroes from the West. Victims are either "regular" American girls kidnapped by barbaric foreigners who must be saved, or poor exotic aliens who are beyond rescue. Heroes are typically people from "civilized" societies like the U.S. or Europe; offenders are savages from the East or Eastern Europe. The result is the phenomenon of a cultural colonialism revolving around human trafficking. As stereotypes are reinforced and retold, society's collective conscious marks Americans as wholesome heroes, and racial and cultural others as mysterious and dangerous. These types of narratives can bolster colonialist attitudes that marginalize the most vulnerable and exploited people of human trafficking. Such attitudes can direct policies and political approaches regarding the eradication of human trafficking that may leave some victims unrecognized or some offenders unidentified. Though wildly entertaining and lucrative, Hollywood films about human trafficking may have elements that prove detrimental to the fight against modern slavery.

Memoirs from Women in the 1960s-1970s: Collective Yet Fractured and Ignored

Vida Bao

Faculty Mentor: Edie Sparks

The 1960s-1970s were a time of incredible political activity and activism for many people in America, especially women of different races and socioeconomic statuses. Through a close analysis of fourteen memoirs or anthologies of memoirs, I compare and contrast women's experiences as activists in various movements, including the Black Power, Free Speech, Chicana, Asian American, and Women's Liberation Movements. I analyze these memoirs as forms of personal biography, history, and political statements. Some points of comparison across different memoirs include common motivators for joining an activist movement, the development of different groups within an overall movement, and sexism within a movement. Within these comparisons, however, the race and class undertones contribute to activist women developing unique political and feminist consciousness. Women from varying backgrounds participated in these movements, and their disparate experiences highlight the privileges of race, class, and time, as these privileges impacted women's agendas as well of their development of political and feminist consciousness. These memoirs reveal reasons for the lack of women's collective activism; women developed different agendas as a response to privilege and as a response to exclusion. Some white feminist consciousness developed from these women's exclusion from different political movements, such as the Left, while feminism from minority women arose as a response to the exclusion from white, middle-class political feminist consciousness. In sum, I assert that understanding exclusion and privilege is essential in understanding the forms of women's activism in the 1960s and 1970s.

Characterizing Organophosphate Resistance in the Mosquito Culex tarsalis

Kiran Mazloom

Faculty Mentor: Tara Thiemann

Graduate Student Mentor: Eva Choi

Culex tarsalis, a mosquito species prevalent on the western coast of the United States, is a primary vector for West Nile virus in California, which makes this species a major target for vector control. Cx. tarsalis is found primarily in rural areas where agricultural pesticides are used, resulting in potential resistance to these pesticides. Organophosphates, one class of pesticides, act as an inhibitor of acetylcholinesterase (AChE) preventing the degradation of acetylcholine from the synaptic cleft and resulting in overstimulation of the nervous system and death of the insect. The purpose of this project was to determine if a mutation in the AChE gene (ace-1) is responsible for organophosphate resistance in Cx. tarsalis. Adult female Cx. tarsalis were collected using CO_2-baited traps from two locations, Sutter and Yuba Counties. A bottle bioassay was conducted using Naled, an organophosphate pesticide, in order to determine which individual mosquitoes were susceptible or resistant. DNA was extracted from these mosquitoes, and polymerase chain reaction (PCR) and DNA sequencing methods were used to amplify and sequence a portion of the ace-1 gene. Additionally, a microplate enzyme assay was conducted to determine if higher concentrations of detoxifying enzymes are responsible for resistance to organophosphates. While results are preliminary, there is no current evidence of a DNA mutation linked to organophosphate resistance in these field populations of Cx. tarsalis. Resistance demonstrated in the bottle bioassays may be due to an upregulation of detoxifying enzymes like alpha-esterase and acetylcholinesterase.

Do Mosquitoes Feed On Individual Chickens Equally, and why is it Important?

Nathaniel Van Ryn

Faculty Mentor: Tara Thiemann

West Nile virus (WNV) is transmitted by mosquitoes and can infect a variety of host species, including many different birds and humans. When infection occurs, the host creates antibodies to fight the virus. This fact has been used to develop WNV surveillance techniques, one of the foremost being used in the Sentinel Chicken Program. In California, sentinel chicken coops are placed around the state and are blood sampled regularly to test for antibodies as an early warning system for WNV outbreaks. The current calculations used to determine the prevalence of WNV in a particular area depend on the assumption that individual chickens are fed upon equally by mosquitoes. However, for other host species, including humans, it is known that mosquitoes prefer certain individuals over others. The goal of the current project is to develop an assay to identify individual chickens in these sentinel coops using microsatellite markers. By determining the identity of chicken blood samples and matching them with mosquito blood meals taken around the chicken coop, potential mosquito preference for individual chickens can be observed. If mosquitoes show a high degree of preference, so chickens are not bitten equally and at random, then this work may be significant in determining the prevalence of WNV in a particular area.

Design and Synthesis of Dizinc and Dicopper Complexes

Brian Pham

Faculty Mentor: Qinliang Zhao

Graduate Student Mentor: Michael Pastor

Dizinc complexes were developed and synthesized by using tunable formamidinate ligands with selective steric hindrance on the substitutes. Dicopper complexes supported by the same ligand framework were synthesized

from the dizinc precursors through a transmetallation route. X-ray crystallography data demonstrated that the two zinc atoms in the dizinc complexes were well separated (Zn…Zn: >2.9Å) while the Cu-Cu spatial separation in the dicopper analogues exists at ~ 2.5Å. This unusually short Cu-Cu distance is supported by the 2.45Å value measured in Cu2((p-tol)NCHNH(p-tol))2 found in the literature. It must be noted that this shortened distance is not attributed to any net metal-metal bond. Each Cu1 atom contains a fully occupied d10 configuration; therefore there is no possibility of a true bond between the two Cu1 atoms in each dicopper complex, due to equal electron occupation in both bonding and antibonding orbitals. The constricted Cu-Cu interaction is indicative of a cuprophilicity interaction between the two Cu atoms.

Sollid Phase Peptide Synthesis

LeRoi de-Souza

Faculty Mentor: Jianhua Ren

Solid Phase Peptide Synthesis LeRoi de-Souza, Ekram Hossain, Zackary Buen, Patrick Batoon Faculty Mentor: Jianhua Ren Abstract: Peptides are the segments of proteins and proteins are the building blocks of life. Peptides carry information to cells and they are major regulators of life. Our group's research focuses on understanding the chemistry of peptides in a solvent free environment called gas-phase. The research requires the synthesis of a library of peptides. The goal of my project is to synthesize a group of peptides including PPD,PPPD , DPPPP, and PPPPD .The peptide synthesized was the PPPD and was analyzed through mass spectrometry. The method used is called Solid-Phase Peptide Synthesis (SPPS). The process includes coupling reactions, deprotection reactions, and washing processes in between. The processes of washing, deprotection, coupling are repeated until the desired peptide is reached. Once the desired peptide sequence has been reached, the peptide is then cleaved off and then purified. Within the purification process, the peptide is dried with nitrogen gas and then is precipitated through the addition of diethyl ether. Subsequent to purification, the peptide is then taken under lyophilization before it is measured. The structures of the peptides are confirmed by mass spectrometry analysis through two scans, a product ion scan and a full scan. The full scan of the peptides displays the amidated peptide's molecular weight and other components that may be present within the sample. The product ion scan fragments the peptide into smaller ionic species to yield a fingerprint like spectrum of the peptide. By using the SPPS method, I have synthesized the peptides PPD and PPPD

Table # 1

Xiao Qingxin: Small Fresh Street Style and Beyond

Sarah Yung

Faculty Mentor: Courtney Lehmann

2015 Pacific Fund Summer Undergraduate Research Fellowship Project

In the context of greater society, fashion is often overlooked and written off as frivolous and unimportant. Yet when properly contextualized and analyzed, fashion trends are often able to reflect and reveal such significant socioeconomic components as countries' economic expansions and recessions, as well as their many varied cultural nuances. China, the most populous country in the world, also incidentally has one of the world's fastest growing economies. After steady financial and economic growth over the past few decades, China's middle class has developed into a prosperous stratum. With their rising prosperity has come a steady appetite for the latest and greatest fashions. A 2009 report by consulting firm McKinsey & Co. states that 80 percent of luxury consumers in China are under 45. By 2015, McKinsey & Co. predicts Chinese consumers will account for more than 20 percent of the global luxury market. Thus, the urban Chinese fashion market holds much relevance in the context of the growth of the global economy. This presentation reflects photojournalistic research into contemporary Chinese middle class urban fashion, conducted in the city of Beijing this past summer. Specifically, this presentation analyzes uniquely Chinese street style trends, including the xiao qingxin of the title, taking into account two fashion shows at the Beijing Institute of Fashion Technology in an effort to identify the extent of influence classical Eastern styles, as well as contemporary Western culture, has on Chinese fashion today. Additionally, this presentation will examine what the rapid growth of China's middle class signifies for domestic and international fashion prospects in the future.

Table # 2

The Next Frontier of American Health Insurance: A Panel Analysis of the Long-Term Care Insurance Market

David Carranza

Faculty Mentor: Michelle Amaral

2015 Pacific Fund Summer Undergraduate Research Fellowship Project

For at least 25 years, the rate of ownership of long-term care insurance (LTCI) has remained steadily low. This trend has continued despite Americans living longer, and thus requiring more years of long-term care services. The purpose of this research is to merge two schools of thought that attempt to explain the stable, but low, ownership rate of LTCI policies. These two schools fall into factors of cost and family/experience. Using the University of Michigan's Health and Retirement Study, a logistic panel regression was created to measure the relative impact of both cost and non-cost variables. In the end, the results seem to indicate that family life and experiences are a stronger indicator of LTCI ownership than the individual's financial situation.

Table # 3

In vitro anti-protozoal activity of the plant glycoalkaloid tomatine

Jenny Liu, Sierra Kanetake, Yun-hsuan Wu

Faculty Mentor: Kirkwood Land

Trichomoniasis is a common, non-viral, sexually transmitted disease caused by Trichomonas vaginalis, an anaerobic protozoan, with millions of cases each year. Although the infection is prevalent, the only treatments available for the STD is the use of antibiotic drugs metronidazole and tinidazole. Also, the number of untreatable cases of trichomoniasis are increasing due to the growing strains of drug resistant T. vaginalis. Tritrichomonas foetus is a related protozoan that causes infections in bovines and domesticated cats. Although the two protozoans are closely related, normal treatment with metronidazole and

tinidazole on T. foetus are ineffective. The increasing amount of drug-resistance cases and the lack of treatment for infection in animals gave rise to the need for developing alternative treatments for the infection. It is common knowledge that many natural products, such as tomatoes and pomegranates, are beneficial for animal health, so we tested several natural compounds on both T. vaginalis and T. foetus to see if they had any antimicrobial effects. Of all the natural compounds tested, tomatine is found to be exceptionally effective in inhibiting T. vaginalis growth. We found that tomatine inhibits growth of T. vaginalis completely at 20 uM concentrations with IC50 of 7.887 uM. In addition, tomatine is potentially very potent on T. foetus as tomatine inhibited growth at 50 uM in both strains of T. foetus tested, C1 and D1.

Table # 4

In vitro anti-protozoal activity of ferrocenyl-chalcones-isatin conjugates on Trichomonas vaginalis

Yun-hsuan Wu, Jenny Liu

Faculty Mentor: Kirkwood Land

Trichomoniasis, caused by Trichomonas vaginalis, is the most common sexually transmitted disease with millions of cases occurring over the world each year. Generally, trichomoniasis is treatable by using metronidazole or tinidazole, which are the only treatments that are FDA approved. Due to the reliance on metronidazole as treatment for the disease, there are now new resistant strains of T. vaginalis on which the drug is ineffective; therefore prompting the development of other forms of drugs. The ferrocenyl-chalcones-isatin conjugates have been synthesized to test on T. vaginalis as an alternative drug for trichomoniasis. Previously, the separate components of the conjugates were tested on human subjects. They have exhibited tolerance to humans making it a possible drug derivative. Furthermore, they were found to display antimicrobial properties, which make promising derivatives. We are analyzing the effectiveness of the ferrocenyl-chalcones-isatin conjugates on the G3 strain of T. vaginalis. In preliminary

testing, we found that most of the conjugate compounds are potent in inhibiting T. vaginalis growth. The IC50 values that ranged less than 10μM functioned the best at the highest concentration of 100μM. Compounds 3 and 4 of the ferrocenyl-chalcones-isatin library are found to be potent at inhibiting T. vaginalis growth with IC50 values of 5.639μM and 5.823μM.

Table # 5

Topographic and Bathymetric Mapping

Tyler Fernandez, Derek Eells, Nicholas Vaughn

Faculty Mentor: Elizabeth Basha

Topographic and bathymetric maps represent a three-dimensional object in a two-dimensional plane, usually with contour lines representing the difference in elevation. Bathymetric maps represent submerged (underwater) terrain while topographic maps represent the natural contours of dry land. This research aims to use a quadcopter to generate detailed low-level topographic maps of terrain and bathymetric maps of riverbeds. Currently, the generation of these maps often misses the fine details of the terrain; we develop new methods to retain these details. Water provides a challenge in bathymetric maps. Normally LIDAR, or similar light sensors, can create fine scale contour maps; however, water attenuates signals making it difficult to measure with light. Sound travels well through water; using sound to generate bathymetric maps requires sonar to retrieve depth and position. These sonar systems utilize a depth sounder in order to collect depth measurements in an area. A program compiles this data and produces the final bathymetric map based on contour lines. To demonstrate the functionality of the bathymetric mapping system, we place different sized blocks in the school pool. We verify that the system detects these objects and includes them in the map. The quadcopter provides the challenge in the creation of small scale, high density topographic maps. The quadcopter severely limits the amount of weight that can be carried, which, therefore, limits the quality of camera that the system can use. A technique called Structure From Motion

creates a point cloud of the terrain. Structure From Motion involves using multiple two-dimensional images, matching common points across the images, and then using epipolar geometry to locate the points in a three-dimensional space. To test the effectiveness of the Structure From Motion system, we take aerial pictures of a rock and confirm that the resulting point cloud contains the rock with reasonable accuracy.

Table # 6

Emotion Displays in Storybooks within American Culture

Katie Perez, Jillian Yelinek

Faculty Mentor: Jessica Grady

Table # 7

Effect of paper size and condition on recycling

Lois Chan, Aroosa Ahmed

Faculty Mentors: Carolynn Kohn

Graduate Student Mentors: Amir Cruz-Khalili

Table # 8

Analysis of Black Widow's scaffolding fibers

Kay Chung, Younjin Lee, Younyoung Lee

Faculty Mentor: Craig Vierra

Spider silk is characterized to be incredibly strong and versatile, making it a valuable resource for manufacturing synthetic fibers for industrial applications. The objective of this study is to analyze the scaffolding fibers of Lactrodectus hesperus, a cobweaver, which

creates asymmetrical three-dimensional web. To date, scaffolding silk has been shown to contain two structural silk proteins, Major Ampullate Spidroin 1 (MaSp1) and Major Ampullate Spidroin 2 (MaSp2). We hypothesize that scaffolding silk contains other novel proteins that have yet to be identified. In order to explore the potential of novel proteins assembled into scaffolding fibers, we collected threads from female black widow spiders, dissolved the fibers in a protein denaturant, alkylated the side chain cysteine residues, and then digested the protein mixture with trypsin. Tryptic peptides were separated using nano high performance liquid chromatography (nanoHPLC) and then subject to MS and MS/MS analysis using an Orbitrap Fusion mass spectrometer. Analysis of the scaffolding threads revealed the presence of several new proteins in scaffolding fibers.

Table # 9

Identification of New Proteins in Black Widow Spider Egg Case Silk Using Mass Spectrometry

Ashneet Dhillon, Jonathan Sir, Brian Woo, Brian Park, Justin Lee

Faculty Mentor: Craig Vierra

Spider silk has been studied for its potential industrial application. With its high toughness and strength, material scientists predict that spider silk can revolutionize the production of materials used in a variety of applications. In the Western black widow, Latrodectus hesperus, a number of proteins are involved in manufacturing and assembling of silk fibers. Knowing more about the function of each protein involved in the silk production pathway will help researchers understand how to produce fibers on a large scale. Specifically, we are interested in finding proteins involved in egg case silk production. The goal of this study was to identify new proteins present in egg case silk. In order to identify new proteins in egg case silk, we dissolved egg case silk fibers with chaotropic reagents, digested the denatured protein mixture with trypsin, purified the protein fragments, then sequenced the peptide mixture using MS/MS analysis. MS/MS analysis was performed using

an Orbitrap Fusion mass spectrometer. MS/MS spectra were searched against the Latrodectus hesperus database using the program Proteome Discover 2.1. After searching the database, MS/MS data revealed that uncharacterized proteins were present in our egg case silk sample. With the discovery of these new proteins we can continue to study the specific structural role they each have in egg case silk, providing more information on how material scientists can replicate this process for industrial applications.

Table # 10

An SMC-like protein is required for hormogonium motility in the filamentous cyanobacterium Nostoc punctiforme

Stacy Cho, Jessica Huynh

Faculty Mentor: Doug Risser

The goal of this project is to identify the genes controlling hormogonium development and motility in the filamentous cyanobacterium *Nostoc punctiforme*. *N. punctiforme* forms nitrogen-fixing endosymbioses with several different plants and fungi. Hormogonia are motile filaments which *N. punctiforme* uses to facilitate dispersal, the establishment of nitrogen-fixing symbioses, and phototaxis. Using a transposon screen, the gene Npun_R5959 was identified as the transposon insertion site in two independent mutant strains of *N. punctiforme.* Npun_R5959, encodes a protein that is homologous to SMC (structural maintenance of chromosomes) proteins, which are involved in the organization and segregation of chromosomes during cell division, the regulation of gene expression, and DNA repair. In the *N. punctiforme* genome, Npun_R5959 is adjacently situated to the *hmp* locus, which is known to be essential for hormogonium development and motility. The genomic proximity suggests that the protein encoded by Npun_R5959 may interact with the Hmp proteins to control hormogonium development and motility. A strain with an in-frame deletion of Npun_R5959 (ΔNpun_R5959) was created to confirm the non-motile phenotype. Currently, the phenotype of the ΔNpun_R5959 strain is being characterized

to determine its role in hormogonium development and motility.

Table # 11

An Analysis of Education in Sub-Saharan Africa

Nahid Kadirzada

Faculty Mentor: Bill. Herrin

Even though Sub-Saharan Africa has made considerable progress; according to the World Bank, all of the other world regions surpass Sub-Saharan Africa in primary completion rate for both sexes . This work uses regression analysis to estimate the determinants of the rate of primary school completion. The primary school completion rate is the dependent variable in this study and it is defined as the "total number of new entrants in the last grade of primary education, regardless of age, expressed as percentage of the total population of the theoretical entrance age to the last grade of primary" (UNESCO Institute for Statistics) . I will be using annual data that account for all of the 46 Sub-Saharan African countries. The explanatory variables are government expenditure on education, income, and childhood employment . My hypothesis is that government expenditure on education, income, and childhood employment will explain why the primary completion rate is low in Sub-Saharan Africa. More specifically, I expect that there will be a positive correlation coefficient for government expenditure and income and a negative correlation coefficient for childhood employment.

Table # 11

A hybrid histidine kinase/response regulator is required for hormogonium development in Nostoc punctiforme

Adriana Pantoja, Mason Tian

Faculty Mentor: Doug Risser

The goal of this project is to identify the genes essential for hormogonium development and

motility in the filamentous cyanobacterium *Nostoc punctiforme*. *N. punctiforme* differentiates hormogonia, motile filaments which facilitate dispersal, the establishment of nitrogen-fixing symbioses with plants and fungi, and phototaxis. Hormogonium motility is driven by a modified type IV pilus-like system that may also secrete a polysaccharide essential for motility. As part of an ongoing project to identify the genes essential for hormogonium development and motility in *N. punctiforme*, we are performing an in depth analysis of Npun_R3825, one of several genes identified as essential for hormogonium motility using a transposon mutagenesis screen. Npun_R3825 encodes a hybrid histidine kinase/response regulator, a type of protein that plays a role in signal transduction, allowing bacteria to sense and respond to their environment by activating a phosphorelay. In order to elucidate the role that Npun_R3825 plays in the gene-signaling cascade controlling hormogonium development, a strain with an in-frame deletion of Npun_R3825 was created. This strain was non-motile and failed to undergo any of the morphological changes associated with the development of hormogonia. Based on this data, we speculate that Npun_R3825 plays an essential role in an early stage of hormogonium development.

Table # 12

Examining the Interaction of the T. vaginalis Homologues of RAD51 and DMC1 with TvBRCA2 via Co-Immunoprecipitation

Colby Chase, Michelle Comroe, Alston Trinh

Faculty Mentor: Lisa Wrischnik

Trichomonas vaginalis, a single-celled protozoan parasite, is the causal agent of the sexually transmitted infection trichomoniasis. Despite only having been observed reproducing by binary fission, the protozoan possesses a genome containing multiple genes known to be active in meiosis, implying that the organism may display a form of "cell sex." One of these genes encodes the RAD51 protein, which is involved in DNA repair of double-stranded breaks during homologous recombination as well as repair after DNA damage. The DMC1 protein is also involved in repairing double stranded breaks, but

only acts during meiosis. Both RAD51 and DMC1 may form a complex with the BRCA2 protein homologue to facilitate attachment to double-stranded breaks; specifically, RAD51 in other organisms has been shown to bind to repeat regions in the BRCA2 protein. Our project involves examining the interaction of both the Trichomonas vaginalis RAD51 and DMC1 homologues with the BRCA2 homologue using co-immunoprecipitation experiments to assay for protein-protein interactions.

Table # 13

Examining the Role of Cystatins in Regulating Trichomonas vaginalis Activity in Co-culture with HeLa cells

Kevin Chung, Sarah Baik

Faculty Mentors: Lisa Wrischnik, Kirkwood Land

Trichomoniasis is a common sexually transmitted disease (STD), affecting around 3.7 million people in the United States each year. In general, women are more commonly infected, yet in most cases symptoms are not present. Trichomonas vaginalis, a parasitic protist, is the causal agent of trichomoniasis. Several virulence factors that Trichomonas vaginalis utilizes include cysteine proteases. These cysteine proteases (CPs) may induce the apoptosis of human vaginal epithelial cells. CPs possess an N-terminal pro-domain that folds into the active site and inhibits protease function until it is cleaved off. The specificity is important as it is detrimental to have a general protease active in the cytoplasm, so controlling the activation of CPs is crucial. In addition to the inhibitory pro-domain, Trichomonas vaginalis also contains three genes which encode for CP inhibitors called cystatins. Our project was to look at the localization of tagged cystatins in Trichomonas cells, examine how the over-expression of cystatins influences Trichomonas behavior in co-culture with HeLa cells; and observe the effects of the purified cystatins on HeLa cells in culture.

Table # 14

Brain Controlled Robot

Christopher Geeter, Antonio Calderon, Seung Ki Song, Viseith Le

Faculty Mentors: Elizabeth Basha, Ken Hughes

See Abstract in Electrical and Computer Engineering Senior Project Abstracts, p. 96

Table # 15

Self-Reported Alcohol Consumption: It Doesn't Add Up

Danielle Cummings, Jade Vo, Erika Brindopke

Faculty Mentor: Carolynn Kohn

Graduate Student Mentor: Molly Hankla

See Abstract for Psychology Department Research Day, page 86

Table # 16

South Asian Americans in Law

Swaja Khanna

Faculty Mentor: Xiaojing Zhou

South Asians have been in this country for centuries, and have made significant contributions to American democracy, especially to its inclusiveness through practice in the law profession. Yet, their contributions are little known to the general American public, and they continue to face discrimination. This paper examines the possible connections between racial/ethnic discrimination South Asian Americans have faced throughout history, and the differences they have made in American democracy through participation in the law profession.

When South Asians first began to migrate to the United States, a majority of them worked as laborers. As a people colonized by the British, they continued to suffer from the legacies of colonialism and racism in the United States.

The Immigration Act of 1917 designated an "Asiatic Barred Zone," a region that covered much of Asia and the Pacific Islands, from which people could not immigrate. Court cases such as *United States v. Bhagat Singh Thind* (1923) ruled that South Asians were ineligible for U.S. citizenship, leading to the revoking of citizenship from those who had been naturalized U.S. citizens.

But the *United States v. Bhagat Singh Thind* also demonstrates South Asians fight for equality. Since the early twentieth century, South Asian immigrants and Americans have actively involved in the struggle for equal rights of people of color in the United States through participation in politics and law. Dalip Singh Saund, the first Indian American member of the House of Representatives from California and Srikanth Srinivasan, a judge of the United States Court of Appeals, are two examples of South Asian Americans who have not only made their mark in the legal community, but also contributed to making American democracy more exclusive. This paper highlights South Asian Americans role in law as an instrument for positive social change.

Table # 17

In-Depth Proteome Analysis of Black Widow Dragline Spider Silk

Eric Fu, Ryan Park, Jason Lee

Faculty Mentor: Craig Vierra

Spider silk in Lactrodectus hesperus (black widow spider) species is renowned for its tensile strength, toughness and elasticity. These properties allow spider silk to outperform some of the best man-made materials such as Kevlar. Despite 6-7 different fiber types, our lab focuses

mainly on Major Ampullate (MA) silk. In particular, we are involved in studying the structural proteins (spidroins), which are the molecules that comprise a vast amount of the silk. Previous proteome analysis of dragline silk has revealed approximately 48 proteins - most are uncharacterized. We hypothesize that our proteome analysis of dragline silk will provide a more comprehensive list of proteins, further revealing unknown proteins that are constituents of dragline silk. In order to discover new proteins, we dissolved dragline silk from black widow spiders with urea to denature the proteins. Proteins were further unfolded using reducing agent, followed by alkylation of cysteine side-chain groups. Following these steps, the proteins were digested with trypsin and the peptides separated using nano high performance liquid chromatography. Peptides were subject to MS and MS/MS analysis using an Orbitrap Fusion mass spectrometer. Spectra were analyzed using Proteome Discover 2.1 software. From our experiment we have generated a new list of proteins that more accurately depicts proteins within dragline silk.

Table # 18

Proteomic Analysis of Scaffolding Silk Fibers from Black Widow Spiders

Amun Rattan, Rishin Patel, Calvin Phen

Faculty Mentor: Craig Vierra

Latrodectus hesperus silk is an extremely strong and versatile material with many possible applications. We believe through a proteomic analysis of scaffolding silk, a major component of cobwebs, we can identify the structural components that give rise to the outstanding properties of spider silk. A glass hook was used to harvest scaffolding silk from captive Latrodectus hesperus cages and the samples were then solubilized in GdnHCl, followed by digestion with trypsin. The resulting precursor peptides were separated by liquid chromatography based upon polarity differences using a C18 resin. Eluted peptides were subject to MS analysis using the new Orbitrap Fusion Trihybrid mass spectrometer. Precursor ions were subject to MS/MS analysis using CID

fragmentation. MS/MS spectra were analyzed using Proteome Discoverer 2.1 software to determine the identities of the peptides. Our results identified several new proteins that are not characterized in the black widow spider. Understanding the protein components of scaffolding silk brings us closer to utilizing Latrodectus silk fibers in medicine and industry for applications such as biodegradable bandaging, bulletproofing, and fiber optic communications.

Table # 19

Characterizing phototactic behavior at the individual filament level for the filamentous cyanobacterium Nostoc punctiforme

Ryan Park, Angela Hwang

Faculty Mentor: Doug Risser

The goal of this project is to characterize the phototactic behavior of individual hormogonia of the filamentous cyanobacterium *Nostoc punctiforme*. *Nostoc punctiforme* can differentiate into three different types of cells depending on the conditions of the surrounding environment. One cell type is hormogonia, short, motile filaments. Previous studies have shown that *N. punctiforme* hormogonia perform positive phototaxis, directed movement towards a source of light. These studies have relied on macroscopic examination of entire colonies, rather than the behavior of individual motile filaments in response to changes in light intensity. In this study, time lapse microscopy has been employed to characterize the phototactic response of hormogonia at the level of individual filaments. Individual hormogonia were recorded before and after exposure to dark periods of varying length and the percentage of filaments that reversed direction following the dark period was quantified. There was substantial variation in the light response of individual filaments. Shorter dark periods (15-30 s) triggered reversals in only a small subset of hormogonia, while longer dark periods (105 s or longer) triggered a reversal in the majority of filaments. However, even these longer dark periods were not sufficient to trigger reversals in 100% of the filaments. Now that experimental protocols and parameters have been established

to quantify phototactic behavior at the individual filament level, these techniques can be employed in future experiments to answer novel questions about the phototactic behavior of *N. punctiforme*, including whether a refractory period exists following a reversal where filaments are un-responsive to light, and a comparison of the behavior of individual filaments of wild-type *N. punctiforme* and a non-phototactic mutant strain.

Table # 20

The evolution of sexual dimorphism: A sex-specification gene in the dimorphic eyes of a crustacean.

Alexis Arenz

Faculty Mentor: Ajna Rivera

We use Euphilomedes carcharodonta as a model organism to study the evolution of sexual dimorphism. Previous work has shown that E. carchardonta eyes are highly dimorphic and this is most likely due to the different ecological niches males and females inhabit. Our lab has also found a handful of eye-development genes correlated with the dimorphic phenotype. However, this only solves the link between eye development and eye phenotype. It does not solve the link between sex and dimorphic eye development. Specifically, how do the eye fields in embryonic E. carcharodonta "know" whether they are male or female. To begin to answer this question, we plan on examining sex-determination genes in E. carcharodonta eye development. Our initial analysis found one gene used in male eye development, the zinc-finger domain transcription factor doublesex (dsx). The first step towards this is cloning dsx from E. carcharodonta. In order to clone the gene, we microdissected eyes and extracted RNA. Then we generated cDNA via reverse transcriptase and used dsx-specific primers to isolate the gene and amplify it through the polymerase chain reaction (PCR). We tailed the amplicon and ligated it into a bacterial cloning vector before transforming it into chemically competent cells. We selected colonies, checked for the presence of an inserted amplicon, and grew them overnight in liquid culture. We then mini-preped our plasmids and checked concentration with a Nanodrop and sent off for sequencing. Although we had initial success with PCR and positive colonies, low concentration of plasmid and negative sequencing results showed us that we need to attempt cloning again.

Table # 21

Examining the Interaction of the T. vaginalis homologues of RAD51 and DMC1 with TvBRCA2 via Yeast 2-Hybrid Assays

Alex Kim, Luke Carreon, Alysia Mascolo

Faculty Mentor: Lisa Wrischnik

Trichomonous vaginalis is a protist parasite that is responsible for approximately 280 million cases of trichomoniasis every year. The disease causes vaginitis. Symptoms include, but are not limited to, noxious discharge and irritation of the vagina (males are often asymptomatic). Most importantly, it leads to susceptibility to other sexually transmitted diseases and premature birth if pregnant women become infected. The parasite is evolving resistance to the main drug used to treat it: metronidazole. Although no one has ever confirmed a sexual stage in the Trichomonas life cycle, the parasite contains many of the genes responsible for meiotic recombination events, such as RAD51 and DMC. Sexual recombination could lead to the spread of resistance among different populations. One major question is whether these meiotic genes are functioning in a similar fashion as their homologues in other organisms. We used Yeast 2-Hybrid Assays to examine protein-protein interactions of RAD51 and DMC with proteins known to interact with their homologues in other organisms, such as BRCA2. If this is successful, it not only confirms that T. vaginalis RAD51 and DMC proteins are capable of interacting with BRCA2 as in other organisms, but also confirms we can use these proteins in Yeast 2-Hybrid library screens to look for new binding partners.

Table # 22

Examining the Transcriptional Upregulation of Rad51 and Dmc1 in Trichomonas vaginalis

Celja Uebel

Faculty Mentor: Lisa Wrischnik

Trichomonas vaginalis is a parasitic eukaryote responsible for 250 million annual Trichomoniasis infections worldwide. Despite the prevalence of T. vaginalis infections there is still much to learn about the organism. Although there is evidence of conserved meiotic genes and of genetic exchange, sexual reproduction in Trichomonas has never been observed in a laboratory setting. The focus of this research is to examine transcriptional upregulation of genes involved in meiosis, such as Rad51 and Dmc1, in hopes of understanding the conditions required for sexual reproduction. Rad51 is involved in the repair of double stranded DNA breaks through homologous DNA pairing and strand exchange, while Dmc1 is meiotic-specific and involved in interhomolog recombination. An analysis of the putative upstream regulatory regions of several meiotic genes did not uncover any obvious shared regulatory elements. This research attempts to identify unique or shared regulatory elements in the upstream regions of TvDmc1 and TvRad51 by first examining conditions that change expression of a reporter gene fused to the TvDmc1 and TvRad51 promoters. T. vaginalis cells transfected with a plasmid containing the postulated regulatory region upstream of either GFP or luciferase are drug treated or examined after strain mixing, and expression is quantitated via fluorescent plate reader, confocal microscopy, and western blot. It is hypothesized that drugs causing direct or indirect double stranded DNA breaks should increase expression of Rad51, while strain mixing may induce expression of both. Early data is consistent with drug-induced expression of Rad51, but no expression of Dmc1 has yet been observed. The discovery of conditions that induce T. vaginalis sex has large implications for understanding the rise of strains resistant to drug treatment and genetic exchange among potentially zoonotic species.

Table # 23

Neural pathologies in an impact-acceleration model of traumatic brain injury in mice

Karen Chung

Faculty Mentor: Robert Rigor

Traumatic brain injury (TBI) is a devastating problem worldwide that contributes to permanent disability and an estimate of 52,000 deaths annually in the United States. TBI frequently occurs as a closed-head injury due to sports and car accidents, and typically without any penetrating damage or bleeding. The pathophysiology of this injury demonstrates diffuse neuronal damage and brain edema. To study the molecular mechanisms responsible for neuronal damage associated with TBI, we adapted the Marmarou impact-acceleration weight-drop model in C57/black6 transgenic mice. Drop height and weight combinations were optimized to induce mild, moderate or severe TBI with low incidence of skull fracture. Mild/Moderate TBI was characterized by convulsions, apnea, 5-15 minutes of unconsciousness, and reversible neurological deficits. In contrast, severe TBI was characterized by irreversible neuronal damage and a persistent vegetative state accompanied by seizures, often followed by death. Diffuse neuronal injury was assessed by the presence of positive degenerating neurons in the hippocampus, cerebral cortex, and white matter areas of the brain, labeled with histological Fluro-Jade stain. This degeneration was further supported by the observation of cell morphological changes visualized using cresyl violet stain. We have successfully designed and physiologically analyzed a reproducible impact-acceleration model of traumatic brain injury in transgenic mice.

Table # 24

Protein Kinase C and D Isoform Signaling at the Blood-Brain Barrier in Response to Interleukin-1β

Supriya Kazi, Karen Chung, Audrey Min, Tim Park, Anish Patel

Faculty Mentor: Robert Rigor

Interleukin (IL)-1β is a pro-inflammatory cytokine that participates in inflammation in the brain and other tissues. In the brain, IL-1β causes microvascular leakage and brain edema. Specifically, brain microvascular endothelial cells that protect the brain (the blood-brain barrier (BBB)) become leaky at intercellular tight junctions in response to IL-1β exposure. Previously, we found that IL-1β exposure decreases electrical resistance (TER) across BBB endothelial cell monolayers, which is preceded by a transient increase in resistance (tightening). We showed that the IL-1β dependent decrease in resistance occurs following activation of protein kinase isoforms PKC-Ɵ and PKD1, and that PKC-Ɵ is required for this response. In addition, PKD activity is required for increased barrier resistance in response to IL-1β, as well as physiological maintenance of BBB integrity in brain capillaries. Based on published reports of direct interactions between novel PKC isoforms and PKD1, we hypothesized that PKC-Ɵ and PKD1 interactions may account for the bimodal response to IL-1β. In the present study, we examined phosphorylation states of PKC-Ɵ and PKD1 using phosphorylation epitope specific antibodies and Western blotting. We found that the IL-1β induced phosphorylation of PKC-Ɵ at T538 (kinase activity site) is decreased by pre-treatment with CID755673 (PKD inhibitor) indicating that PKD activity is required for PKC-Ɵ activation. On the other hand, sotrastaurin (PKC-Ɵ specific inhibitor) failed to prevent PKD phosphorylation at S916 (kinase activity site). Therefore PKC-Ɵ activity is not required for PKD activation. In contrast, sotrastaurin prevented PKD phosphorylation at S744/S748 (translocation site) in response to IL-1β, indicating that PKC-Ɵ activity is required for PKD1 translocation away from the plasma membrane. This suggests that PKD1 tightens the BBB during the early transient rise in resistance, and BBB protection is later abrogated when PKC-Ɵ signals to PKD1 to translocate away from the plasma membrane.

Table # 25

Development of a Drug Dissolution Test and Automated Analysis Method Using a Quartz Crystal Microbalance

Joshua Arucan

Faculty Mentor: Shelly Gulati

Development of a Drug Dissolution Test and Automated Analysis Method Using a Quartz Crystal Microbalance Abstract by Joshua Arucan A dissolution testing methodology was developed in our laboratory using a commercial quartz crystal microbalance (QCM) system to measure dissolution rates of drugs. This technique has advantages over current pharmaceutical testing methods which are resource, sample, and time intensive. This undergraduate research project focused initially on reproducing the dissolution testing methodology developed by a former Master's student. Reproducibility tests were performed using the same drug film system of benzoic acid in isopropanol at identical mass and volume applications as previous testing. Additionally, the films were dissolved using water as a dissolution fluid at the same flow rate conditions. During testing, it was found that the testing system is highly sensitive to the quality of the quartz crystal. Significant reuse of the crystal was identified as a potential source of error and we recommended that the crystals be replaced after 50 uses to ensure measurement accuracy. Once the method was successfully reproduced and validated against previous results, addition flow rate conditions were tested. The results confirm with the increase in initial drug dissolution rates expected with increased hydrodynamic forces. Additionally, a program script was developed to automate data analysis and graphing while dynamically assessing regions of interest.

Table # 25

A MICROFLUIDIC DEVICE FOR MARKING SMALL TISSUES

Colleen Motoyasu, Brad Hirayama

Faculty Mentor: Shelly Gulati

Microfluidics focuses on the handling and analyzing of fluid and biological materials in structures ranging from 10-1000 um. Microfluidic devices, which can be rapidly prototyped within hours, decrease the cost of research by minimizing reagent use and enabling multiple experiments in parallel. Applications of microfluidic technology include identifying diseases and providing point of care diagnostics. In this project, a microfluidic device was developed for marking small tissues. The inspiration of this project was Drosophila (fruit fly) brains used in the study of Parkinson's disease. Currently, lines of Drosophila are crossed, and the offspring's brains are removed and analyzed. Dopaminergic neurons on the brains are marked in Eppendorf tubes using a three-chemical process with incubation and wash steps. The brains are removed and studied to see if the genetic cross caused degradation of the neurons. Conventional procedures are time-intensive, require expensive reagents, and are only performed in small batches because the tissues are delicate. The microfluidic prototype incorporated critical design factors for use with Drosophila tissue and in this study we demonstrated operation with a sample tissue. The device includes wells for the brains and serpentine channels to promote mixing. Five brains could be tested simultaneously on a microscope-slide sized device. The delicate tissue is protected because brains are separated into different wells and the flow rates are low. This design is molded into an elastomer and sandwiched between two acrylic plates to enclose the channels. This allows for removal of tissue after microfluidic marking for testing, device reuse, and minimal reagent consumption. Because multiple tests can be performed in parallel the process is also less labor intensive. The successful proof of principle of the device for a sample tissue has been demonstrated and suggests it could be effective for marking Drosophila or other small tissues.

Table # 26

IDENTIFICATION AND ANALYSIS OF PROTEINS IN SPIDER TUBULIFORM SILK

Julian Shen, Andrew Sun, Christine Park

Faculty Mentor: Craig Vierra

Julian Shen, Andrew Sun, Christine Park and Craig Vierra   Department of Biology, University of the Pacific, College of the Pacific, Stockton Spiders contain 7 different silk-producing glands that produce high performance threads. Because these fibers have extraordinary mechanical properties, it has attracted the attention of scientists across the globe. One gland, which is referred to as the tubuliform gland, manufactures the fibroins Tubuliform Spidroin 1 (TuSp1), Egg Case Protein 1 (ECP-1) and Egg Case Protein 2 (ECP-2). One of the primary functions of tubuliform silk is to protect eggs from the environment. Scanning electron microscopy studies reveal that egg cases or sacs are composed of different silk types: tubuliform and aciniform silk. We hypothesize the egg sacs contain additional, uncharacterized proteins. In order to identify new proteins in egg sacs, we collected egg sacs spun from female black widow spiders, carefully removing the eggs. The fibers were dissolved in urea to denature the proteins, subject to alkylation using iodoacetamide, and then digested with trypsin. Tryptic peptides were separated using nano high performance liquid chromatography and analyzed by MS and MS/MS analysis using an Orbitrap Fusion mass spectrometer. MS and MS/MS spectra were analyzed using the Proteome Discoverer 2.1 software. Several novel proteins were discovered as constituents of egg sacs.

Table # 27

Identifying Novel CReP-Binding Proteins

Stephen Do, James Choi, Winston Limhengco, Jackie Dong, Lily Chen, Lily Chen

Faculty Mentor: Douglas Weiser

A variety of cellular stress responses are linked to the phosphorylation of eukaryotic initiation factor 2 alpha. Kinases phosphorylate eIF2a, resulting in lowered rates of translation, and phosphatases dephosphorylate eIF2a, resulting in increased rates of translation and ultimately induces apoptosis. GADD34 (growth arrest DNA damage 34) and CReP (constitutive repressor of eIF2a phosphorylation) form a complex with PP1 (protein phosphatase 1) to dephosphorylate eIF2a. Yeast two-hybrid was done to find potential protein-binding partners to CReP. CReP was bound to the DNA binding domain and used as bait in search of any proteins from the HeLa cell cDNA library. Of all the hits found from yeast two-hybrid, SNAPIN and COP9 were most common. SNAPIN and COP9 have never been studied in collaboration with CReP. However, what is known of COP9 is that it is involved in protein degradation, and SNAPIN has a role in mediating BACE1 retrograde transport. In this experiment, we will be preparing the test for what the functions of COP9 and SNAPIN are when bound to CReP in vivo. This work can help us understand the responses of cells when undergoing stress.

Table # 28

The Effects of Academic Stress on Force Output

Nicole Laskosky, Voon Chi Chia, Stephanie Gee, Mark Morozumi, Angie Wei

Faculty Mentor: Courtney Jensen,

Student athletes must perform both on the field and in the classroom. Balancing these demands often results in considerable stress, which may have consequences on performance. While the burden of athletic commitments on student scholarship is a major concern, the question is seldom asked the other way around: How is athletic performance affected by scholastic responsibilities? We sought to answer this question in a group of recreationally active undergraduate students at a private D1 university in Northern California. We enrolled 23 students in a protocol that evaluated both psychological stress and skeletal muscle performance at two different points in the semester. Stress was measured by a previously-validated 10-item questionnaire designed to assess degree of current stress and ability to cope. Muscle performance was measured with a Cybex Humac Norm dynamometer system. Multiple linear regression analyses tested the effect of psychological stress on muscle function. We found elevations in scholastic stress to correlate with an improvement in muscle performance (p=0.004).

Table # 29

The use of a platelet rich plasma injection for a 2nd degree ulnar collateral ligament sprain in a female olympic water polo player

Teralyn Dodds

Faculty Mentor: Christopher Ludwig

Background: A female Olympic level water polo player sustained a valgus force to the elbow while throwing during practice resulting in a 2nd ulnar collateral ligament (UCL) sprain. The patient's injury was confirmed through evaluation by an orthopedic physician and diagnostic imaging. The athlete wanted to be cleared and pain free for prior to participation in an Olympic qualifying event six weeks post her UCL injury. **Treatment:** Outcomes were assessed using a standard a non-operative rehabilitation program timeline for an UCL sprain, and active range of motion measurements pre/post PRP injection. One-week post injury, athlete received the platelet rich plasma (PRP) injection. Days 4-7 active range of motion exercises and strengthening exercises were done to regain the deficits in range of motion and strength. Day 7 athlete was pain free with full active range of motion. Week two, the patient began strengthening the shoulder and elbow, and

participating in non-contact swimming. Week three, the patient began proprioceptive exercise. Week four, the patient was full contact and pain free. **Results:** The patient had full pain free active range of motion in all ranges one week post injection compared to the traditional treatment of being immobilized during the same phase. The patient was full contact and pain free by week four compared to the 7-10 week timeline given for rehabilitation without the injection. **Uniqueness:** PRP injections for UCL sprains are becoming more popular; however, it is not a standard treatment. There are very few evidence based rehabilitation or return to play protocols. This case can add to the body of knowledge regarding the use of platelet rich plasma injections for grade two UCL sprains. **Conclusions:** Based upon the standard rehabilitation time frame for a non-operative UCL sprain the PRP injection, in conjunction with a rehabilitation program, shortened the return to play timeframe by two weeks.

Table # 30

The Role of BGS13 in Supersecretion in Pichia pastoris

Kai Her, Aaron Hang, Jimmy Suliman, Chaeeun Kim, Mary Tran, Christina Uribe

Faculty Mentors: Geoff Lin-Cereghino, Joan Lin-Cereghino

Pichia pastoris is a methylotrophic yeast that has been genetically engineered to express over five thousand heterologous proteins valued for industrial, pharmaceutical, and basic research purposes. Often some proteins are not secreted efficiently from the P. pastoris cell. We have identified a mutant strain disrupted in the BGS13 gene that causes super secretion of many different reporter proteins. Bgs13p is a homolog of Pkc1p, a noted kinase in all eukaryotic cells. Our bgs13 strain contains a hybrid mRNA consisting of pREMI plasmid and a truncated bgs13 sequence which we believe is the cause of the super secretion. Our goal is to determine if this hybrid pREMI-bgs13 is dominant to the normal BGS13. We have expressed the hybrid and the truncated bgs13 mRNA in wild type cells that have the normal BGS13 which produce

lipase and human serum albumin reporters. If either the truncated bgs13 or pREMI-bgs13 hybrid is dominant to the wild type BGS13, then we should see elevated secretion of the reporters. Our results illuminate the relationship between the normal BGS13 and the hybrid bgs13. Creating a universal super secretor mutant strain with bgs13 raises the possibility of advancing medical science by enhancing production of life saving recombinant proteins.

Table # 30

Mat Alpha Leader Analysis for Pichia Pastoris Secretion

Vivian Tam, zill-e-huma khan

Faculty Mentors: Geoff Lin-Cereghino, Joan Lin-Cereghino

The methylotrophic yeast, Pichia pastoris, has been genetically engineered to produce many heterologous proteins for modern medical and research goals. In order to secrete proteins for easier purification from the extracellular medium, the coding sequence of recombinant proteins is initially fused to the Saccharomyces cerevisiae alpha-mating factor secretion signal. This "MAT alpha" signal acts like an address label that should direct the protein out of the cell. We surmised the removal of certain regions of amino acids should facilitate HRP protein secretion by increasing the flexibility of the MAT alpha loop region. Using bioinformatics, the Lin-Cereghino lab has created a model of the secretion signal as a guide for a series of mutated sequences in order to comprehend how this region functions and to further examine key mutations. Mutation delta 57-70 has shown very high secretion (150% of wild type) and mutation delta 61-70 has shown low secretion (80% of wild type). Our lab has been working to determine the secretion of mutations delta 58-70, 59-70, and 60- 70 to narrow down the important amino acids in mass secretion for MAT alpha. The findings from this experiment suggest which amino acids play a key role in higher efficiency in the MAT alpha. Our interpretations raise the possibility of creating more efficient processes of secreting proteins that are vital to products that

fight diseases such as cancer, hepatitis B&C, and diabetes.

Table # 31

Characterization of Thin Film Application Parameters for Drug Dissolution Testing Using a Quartz Crystal Microbalance

Kylee Schesser

Faculty Mentor: Shelly Gulati

A dissolution testing method has been developed using a commercial quartz crystal microbalance (QCM) system with a microfluidic flow cell to measure drug dissolution rate. Drug dissolution rate is useful because it provides critical information on drug release timing, location, and duration. All of these factors are necessary in understanding the effectiveness of a drug and such information may be used to inform future design. The QCM method is capable of measuring minute mass changes directly and rapidly thus making the QCM method less resource, sample, and time intensive than traditional drug dissolution methods. To conduct the test, first a thin film of the drug is applied to a flat quartz crystal. The crystal with drug film is installed into the QCM and a flow cell is attached. Dissolution solution is introduced via the flow cell and passes over the drug film dissolving it. The QCM system simultaneously oscillates the crystal and the change in resonant frequency of oscillation is proportional to the mass being lost into solution. The temporal change in frequency is recorded nearly continuously by the acquisition system. From this the signature dissolution curve and dissolution rate are obtained. However, in order to optimize the procedure of the QCM technique, a deeper understanding of influence of the thin drug film to the crystal is needed. In this study, we parametrically explored the ideal ranges for both surface coverage and total mass applied for this QCM and flow cell system using benzoic acid as a model drug. A threshold was found for the minimum area fraction of coverage required for operation. Using this threshold, the relation between applied mass and resonant frequency

was developed and the linear sensitivity factor compared with expected for quartz crystals. Total masses that diverge from the linear regime should not be selected.

Table # 32

SPECT Image Processing: MATLAB as an Image Processing Tool for Nuclear Medicine

Rachel Flores, Chase Crimmins

Faculty Mentor: Huihui Xu

Nuclear medicine is an important mode of imaging due to its diagnostic capabilities. While obtaining nuclear medicine images, there are physical factors such as Compton scattering as well as system limitations such as the spatial resolution of the gamma camera that affect the image quality. The lowering of the image quality makes it more difficult for radiologists to analyze the images and can affect the overall diagnosis and well-being of the patient. Image processing is a very important step in evaluating nuclear medicine images because it can help correct or compensate for this low image quality. There are many ways to do this, one of which uses the program MathWorks Matrix Laboratory (MATLAB). By using MATLAB, one can better study, understand, and use information from nuclear medicine images by investigating regional properties, analyzing image boundaries and curvature, filtering out noise from the image, and resizing the image. In this project, we will go through the use of MATLAB to contour, interpolate, filter, segment, and remove background of a Single Photon Emission Computed Tomography (SPECT) image of a sagittal slice of mice lungs.

Table # 33

The role of CReP in reversing eIF2-alpha phosphorylation after ER stress

Messina Fotinos

Faculty Mentor: Doug Weiser

The accumulation of unfolded proteins in the endoplasmic reticulum (ER) causes ER stress

and leads to the unfolded protein response (UPR). During the unfolded protein response, reversible phosphorylation of the alpha subunit of eukaryotic translation initiation factor 2 (eIF2-α) occurs. This phosphorylation event is necessary in the UPR to decrease rates of protein synthesis by regulating mRNA-specific translation. The reversal of eIF2-α phosphorylation occurs through cellular phosphatase complexes that contain a protein phosphatase 1 catalytic subunit (PP1) and substrate-specific regulatory subunit. Substrate-specific regulatory subunits identified in mammals include PPP1R15A (GADD34), a growth arrest and DNA damage-inducible protein, and PPP1R15B (constitutive repressor of eIF2-α phosphorylation, CReP) which is constitutively expressed in the cell. Previous structure-function studies identified two regions that were required for PP1 binding in the C-terminus of GADD34. In addition to PP1 binding, N-terminal residue deletion studies of green fluorescent protein (GFP)-GADD34 showed that subcellular targeting of GADD34 to the ER, and consequently the alpha isoform of PP1, were necessary for reversal of eIF2-α phosphorylation. While structural homology is not present between the N-terminus of mammalian GADD34 and CReP, our imaging studies of human GFP-CReP (GFP-hCReP) N-terminal deletion constructs suggest that functional homology exists. We used confocal microscopy to study GFP-hCReP transfected HELA cells expressing full-length and various N-terminal deletion constructs of GFP-hCReP. Full-length GFP-hCReP showed perinuclear sub-localization patterns suggesting ER localization, homologous to subcellular localization patterns seen in full-length GADD34. GFP-hCReP N-terminal deletion constructs showed loss of subcellular perinuclear localization. As deletion lengths increased, GFP-hCReP showed increased diffuse cytoplasmic presence and eventually appeared throughout the nucleus of the HELA cells. Future studies analyzing eIF2-α phosphorylation will be done in the presence of GFP-hCReP N-terminal deletion constructs that lack ER targeting domains in order to determine if subcellular localization is required for their function.

Table # 33

Role of Zip Kinase in the Development of Early Embryonic Cells

Gene Park, Wesley Hung

Faculty Mentor: Douglas Weiser

Reversible phosphorylation of the Type II Myosin Light Chain 2 (MLC2) is a crucial mechanism for regulating the Type II Myosin and the actin cytoskeleton. Zipper Interacting Protein Kinase (ZipK) is a major regulator of Myosin Light Chain 2 through phosphorylation of the MLC2 complex. This mechanism is imperative for proper myosin and actin cytoskeleton contraction and other cellular processes that contribute to morphogenetic cell movements through development, smooth muscle contraction, and tumor cell invasion. ZipK and ROCK are regulators of Myosin Phosphatase, which is responsible for dephosphorylating MLC2. This occurs when ZipK/ROCK phosphorylates Mypt1 (Myosin Phosphatase Target Subunit 1) at the conserved threonines 696 and 850, which will inhibit Myosin Phosphatase activity. Therefore, when ZipK is inactivated, cells exhibit irregularities such as disorganization of the cell membrane in addition to improper functioning of actin and myosin. This could lead to defects in mitosis, cell movement, and initiate the process of apoptosis. To analyze the morphogenetic defects in Zebrafish lacking Zip Kinase, in-situ hybridization probes are needed to mark specific regions of the embryo. The probes that are currently in the process of being built are hgg1 (prechordal plate), shh(midline), pax 2.1 (midbrain-hindbrain boundary), dlx3 (neural plate), and papc (presomatic mesoderm). To create the probes, restriction digests were carried using appropriate enzymes for anti-sense and sense probes. Phenol chloroform extraction was carried out to isolate the RNA so that a transcription reaction could be performed. We hope to continue our research by carrying out staging of the fish, permeabilization, and hybridization of the embryo. By viewing morphant embryos next to Wild type embryos, we will be able to determine the morphological difference using probes specifics to a region of the embryo

Table # 35

The Destructive Patriarchy Inherent in Women's Advertisements

Sierra Gonzalez

Faculty Mentor: Paul Turpin

American consumer advertising has become a critical element in demonstrating how systems of patriarchy continue to be propelled and sustained in today's society. Patriarchy is a system organized around the principle that what men (should) want comes first, and everything else follows from that. It shapes all aspects of life, both collective and individual, oppressing women and stunting men's growth. This form of oppression is a coherent system that shapes all aspects of life both collective and individual. The relentless focus on youth in advertising poses significant social and personal challenges for women especially as they age. By carefully analyzing the pervasive techniques and strategies of consumer advertising we can understand much about the systematic continuity of the social and cultural patriarchal values that are consciously and subconsciously reinforced against the physical and mental maturation of women. This project will examine a series of advertisements targeted to women in their 30s, 40s and 50s to demonstrate (1) how patriarchy functions as the dominant social structure (2) how this dominant social structure informs the pervasive use of spectacle that women have been socially constructed to identify with (3) how this spectacle conditions women to attempt to live up to unrealistic standards of youth, beauty and "femininity" (4) the effects this conditioning has on aging women's self-esteem, self perception and social identity and (5) the critical role advertisements play in reinforcing this unhealthy standard.

Table # 36

Hope Street Mentorship for At-Risk Youth

Lindsey Nielson,

Faculty Mentor: Dylan Zorea

The goal of this research is to better understand the impact of college student mentoring for students from low income areas who are at-risk of not graduating high school. The author will create a business plan for Hope Street Organization, a registered student organization focused on building relationships between college students and at-risk middle school students. The business plan is to include a comparison between Hope Street Organization and similar mentoring programs aimed at assisting youth in inspiring vision for a successful academic future and reaching their academic goals. It will also include scholarly research into methods for reaching youth and training mentors. This business plan will include research into the financial means necessary to run such an organization, recruitment of college mentors, appropriate training and certifications of college mentors, and the anticipated impact of such an organization on youth.

Table # 1

Computational Investigation into the Nature of Technetium-Technetium Bonding Within the Octachloroditechnetate (Tc2Cl82- / 3-) Anions

Johnson Liu

Faculty Mentor: Anthony Dutoi

2015 Pacific Fund Summer Undergraduate Research Fellowship Project

Experimental investigations into the behavior of the technetium-technetium (Tc-Tc) bond within the octachloroditechnetate ($Tc_2Cl_8^{2-/3-}$) family of anions suggest that the expected trend between bond order and bond length is not followed by the metal-metal bond within these anions. The simple model of bond order provides a qualitative relationship between bond length and bond order. As the bond order between two atoms increases, a decrease in the distance between the atoms is expected. However, high-level theoretical calculations found in the literature seem to support the experimental observation that the Tc-Tc bond is longer in the $Tc_2Cl_8^{2-}$ anion, which has a higher Tc-Tc bond order, than in the $Tc_2Cl_8^{3-}$ anion, whereas low-level calculations produced inconclusive results on the relationship between bond order and bond length for the Tc-Tc bond. In order to develop a better understanding of the behavior of the Tc-Tc bond, we first repeated several calculations using the lower-level theoretical models to produce graphs of energy versus Tc-Tc bond length. The most stable Tc-Tc bond length is that in which the total energy of the anion is at a minimum on the energy-bond length curve. Indeed, the Tc-Tc bond lengths extracted through this procedure provided mixed results as to which anion has the longer Tc-Tc bond. Now convinced that lower-level models are insufficient in modeling the behavior of metal-metal bonding within the $Tc_2Cl_8^{2-/3-}$ anions, preliminary high-level calculations have been initiated. The high-level model found in the literature provided insights into the strengths of bonds between the Tc atoms, but did give any deeper explanation for the orbitals involved in the Tc-Tc bond. Although this level of theory is expected to be more reliable than the high-level models that we are currently using, these superior calculations are also more expensive and more difficult to work with.

Table # 2

Knob-Socket To 'Em: Investigating Protein/DNA Binding Interactions Using the Knob Socket Model

Sruti Elson, Vivian Chen

Faculty Mentors: Jerry Tsai, Hyun Joo

Understanding how proteins specifically bind and recognize DNA has important implications in the understanding of many diseases and how to combat them.   The Knob-Socket model of packing structure provides a novel approach to analyzing protein-nucleic acid interactions. A Knob-Socket analysis of the protein-DNA interface produces an intuitive mapping of the protein and DNA three dimensional structure onto a two dimensional map. This topological packing maps allows for unique insight into the specificity of how proteins and DNA recognize each other. From an analysis of the Knob-Socket surface topology maps, this research illustrates a general framework for how the classic basic leucine zipper alpha-helices bind to DNA. DNA packing is divided into specific interactions with the nucleic acid bases and non-specific interactions with the phosphate backbone groups. The i±4 ridge of the protein divides the binding of the alpha-helix into two regions of sockets that recognize the DNA bases: one on the coding strand and the other on the non-coding strand. The pocket pattern and amino acid composition on the alpha-helices determine specificity for DNA base recognition. Therefore, this general framework not only explains the specificity and recognition of protein and DNA binding, but also provides a predictive model. The results demonstrate that the knob-socket model can rationally investigate and produce clear insight into protein-DNA binding interfaces. This research presents a clear understanding in the fundamentals of binding interactions, which provide the framework for further work in investigating the biochemical mechanics of disease and drugs to combat them.

Table # 3

Cuprophilicity in Dicopper Complexes Supported by Formamidinates

Isabella Tran, Alexander Huynh

Faculty Mentor: Qinliang Zhao

Graduate Student Mentor: Michael Pastor

Dicopper complexes were synthesized through a transmetallation or a direct metallation route. Structural characterization demonstrated that the two copper(I) atoms in a planar eight-member ring were brought together by two formamidinate ligands. The CuI-CuI separation is about 2.5 Å, similar to the analogue Cu2((p-tol)NCHNH(p-tol))2 (2.45 Å) in the literature.[1] It was not the metal-metal bonding, however, that caused the close distance between the two copper atoms. The valence electron configuration of a CuI atom is d10. It contains a fully occupied d-orbital; the number of metal-metal bonding and antibonding orbitals are equal. With a bond order of 0, no overlap can exist between the d-d orbitals of two CuI atoms in a complex molecule. No net metal-metal bond can form. Despite the supposed lack of bonding between two complexed CuI atoms, the CuI-CuI shortened distance can be attributed to a weak interaction between the two atoms, partially aided by the s orbital to the σ and σ* which facilitates the Cu-Cu interaction.[1], [2] The shorter than expected Cu-Cu separation may be contributed to a weak interaction, termed cuprophilicity. Cuprophilicity, like other metallophicity such as argentophilicity and aurophilicity, is a special interaction exhibited between closed shell Cu atoms.   [1] Cotton, F. A,; Matusz, M.; Poli, R.; Feng, X. J. Am. Chem. SOC. 1988, 110, 1144. [2] Poblet; Josep-M.;Bénard, M. Chemical Communications Chem. Commun. 1998, 11, 1179-180.

Table # 4

Effects of heat wave on thermal performance of immune function

Amy Ahn, Carolyn Pak, Janice Park

Faculty Mentor: Zachary Stahlschmidt

Climate change is increasing the frequency and intensity of heat waves on a global scale. Such environmental change can negatively affect animal physiology. Animals, however, may respond by exhibiting adaptive plasticity, such as altering their thermal performance or sensitivity (e.g., the temperature at which performance peaks may shift upward in response to a heat wave). Thus, to investigate the impact of a heat wave on animal physiology, we measured the thermal sensitivity of immune function in corn snakes (Pantherophis guttatus). Specifically, we assayed the performance of two metrics of innate immunity (hemoagglutination and hemolysis of foreign blood cells) at five different temperatures (5, 15, 25, 35, and 45°C) after snakes experienced either control or heat-wave temperature treatments. Agglutination and lysis performance were positively correlated, and immune performance tended to be higher at lower assay temperatures. Peak (maximal) performance and temperature breadth were negatively correlated for agglutination, meaning P. guttatus exhibits a temperature generalist-specialist tradeoff. However, metrics of thermal performance of hemoagglutination and hemolysis were not influenced by heat-wave treatment. Elevated temperatures associated with climate change may reduce the effectiveness of innate immune function because heat waves appear to have little effect on the thermal plasticity of immune function and immune function tends to perform better at lower temperatures. In the future, we will investigate the effects of heat wave on thermal performance of other metrics of immune function (bacteria-killing capacity), as well as on antioxidant capacity and oxidative damage.

Table # 5

Dietary and Spatial Preferences of Urban Ants

Dustin Johnson

Faculty Mentor: Zach Stahlschmidt

To survive, animals in cities must navigate disturbed environments to find their preferred food (e.g., sugar-rich, protein-rich, or mixed nutrient [sugar and protein/fat] sources of food). Here, on the University of the Pacific campus (a model urban environment), we examined the food preferences of actively foraging ants using four types of bait (sugar, tuna, honeyed tuna, or cookies [Pecan Sandies®]) across microenvironments that varied in the degree of sunlight (shaded or unshaded) and type of surface (paved or unpaved). Across seven different species, we detected significant effects of surface type on the number of species (i.e., species richness) on each bait and of the type of bait on the evenness of each species. Unpaved surfaces (grass or dirt) had greater numbers of species while honeyed tuna and Pecan Sandies® baits had greater evenness than sugar baits. This study suggests that ant communities in an urban environment prefer food sources that are more nutritionally complete (i.e., composed of both sugar, as well as protein and/or fat) and that are found on unpaved surfaces. Because urban environments are characterized by paved surfaces but also by a relative abundance of nutrients (e.g., discarded food or food containers), future studies should further explore dietary and spatial preferences in both rural and urban environments.

Table # 6

Preliminary outcrop-scale Rf/ϕ petrofabric analysis of conglomerate from the Jurassic Tuttle Lake Formation; Mount Tallac roof pendant, El Dorado County, CA

Jessica Robinson, Allison Jones, Allison Severson, Brianna Barber, Samuel Noethe

Faculty Mentor: Kurtis Burmeister

A preliminary 3D Rf/ϕ analysis of outcrop-scale petrofabrics in near-orthogonal exposures of conglomerate reveals a heterogeneous pattern of penetrative strain within the southernmost Mt Tallac roof pendant. Our analysis was conducted in outcrops of the Jurassic Tuttle Lake Formation near Grass Lake in the Desolation Wilderness Area of Eldorado National Forest. The Jurassic Tuttle Lake Formation contains a thick sequence of weakly metamorphosed volcaniclastic deposits cut by four sets of intermediate dikes, the Jurassic Keith's Dome granodiorite pluton, and an array of predominantly sinistral ductile shear zones and brittle faults. Recent observations of shapes and orientations of clasts in the Tuttle Lake Fm led to the hypothesis was the unit was deformed by the intrusion of the Keith's Dome pluton. To test this hypothesis, we examined petrofabrics at nine locations along a N-S transect between Grass Lake and the Keith's Dome pluton. Four flat, near-orthogonal faces containing clasts with discernable boundaries were selected at each location. Where possible, outlines of at least 60 clast boundaries (color coded by clast composition) were traced onto clear plastic overlays. Photo-registration marks, location information, and the strike and dip of each face were also recorded onto overlays. Photographs of overlays were adjusted, rectified, and reoriented in Adobe Photoshop. The EllispeFit 3.2.2 (Vollmer, 2015) computer program was used to conduct Rf/ϕ analysis of the clasts in each tracing and to compile fabric ellipsoids at each location. Our results reveal a range of fabric magnitudes and shapes (weakly oblate to moderately prolate, E 0.15 to 0.81, Nu -0.31 to 0.47). When bedding is restored to horizontal, oblate fabrics appear to be consistent with vertical flattening associated with deposition and compaction. Prolate fabrics record higher strains and subhorizontal long (X) axes that generally trend NE-SW. However, these X axes orientations correlate poorly with each other and with trends of dikes, shear zones, and faults in the Grass Lake area. Given deformation fabrics in other Sierran Jurassic roof pendants, it is interesting that the Tuttle Lake Fm has not accumulated a more pervasive penetrative strain. Further study is needed to determine the cause of these localized strain accumulations and their context in the regional host rock geology.

Table # 7

The amphibian portrait: individual identification of túngara frogs through image recognition software

Caitlin Ha

Faculty Mentor: Marcos Gridi-Papp

Individual identification is a key aspect of research or husbandry of populations in which individuals need to be tracked across encounters. This is a challenge in many amphibians that have the body covered in soft wet skin and present no dry structures that can be tagged, clipped or stained without injuring the animal. A variety of techniques has been employed in amphibians, toe clipping being the most common. In this study we evaluated the effectiveness of photographic identification in a captive colony of túngara frogs (Engystomops pustulosus). The highly pigmented abdominal skins of túngara frogs form patterns which are distinct for each frog. We took pictures of the ventral skin in 220 adult frogs and compared these exemplar images with selections from a pool of > 800 additional pictures of the same animals using open source image-recognition software (IBEIS). We compared the similarity indices of the first and second matches in identification searches of: 1) 50 randomly selected images; 20 images of frogs with dirt (moss) attached to the skin; and 30 images of individuals fully inflated in defensive behavior. All tested individuals were identified correctly. In the random sample, the average first match had a similarity score 135 times higher than the second match. This proportion was reduced to 114 in dirty animals and increased to 177 in inflated animals. This study shows that photographic identification is robust and effective for individual identification in túngara frog populations with > 200 individuals. This method is less invasive than toe clipping, transponders or tattooing, and it can be applied to larger populations than tattooing or toe clipping. It is inexpensive, fast, does not require skilled labor, and it can be used with captive or wild populations.

Table # 8

Auditory tuning disparities in túngara frogs (Engystomops pustulosus) - comparing hearing pathways through midbrain recording.

Jesse Herche, Alice Lin

Faculty Mentor: Marcos Gridi-Papp

Túngara frogs rely primarily on acoustic advertisement calls to find a mate. These calls consist of a low frequency "whine" from 400-900 Hz, essential for species recognition, followed by an optional higher frequency "chuck" near 2500 Hz. In most species of frogs, the hearing pathway is tuned to have maximal sensitivity at the species' peak vocalization frequencies, however characterizations of túngara frog eardrum sensitivity in our lab show peak response near the chuck frequency. We examined the neural hearing sensitivity of túngara frogs by recording auditory evoked potentials at the torus semicircularis in response to a tone sweep. The recorded neural response was consonant with reports in the literature - peak sensitivity at low frequencies (below that of the whine) and a secondary peak with reduced sensitivity in the chuck range. In small amphibians, other body parts besides the eardrum, such as the body wall and the arms, can also serve as auditory receptors. This hypothesis is supported by preliminary results in which túngara frogs hear low frequencies even when a thick coat of vaseline dampens their eardrum bulging. However, laser vibrometry measurements of the body wall and arms have failed to detect any considerable vibration response in the 200-700 Hz range, therefore the pathway for reception of low frequencies remains unidentified. This puzzling mismatch among the tuning of the eardrums, brain and male calls is uncommon in frogs and its explanation may reveal a novel auditory mechanism.

Table # 9

The Auditory Morphology of the Tungara Frog

Alice Huang

Faculty Mentor: Marcos Gridi-Papp

Frogs have evolved thin eardrums and auditory ossicles to match the low impedance of air with the high impedance of body tissues and allow communication through airborne sound. Certain species of frogs live their adult lives and communicate underwater. Studies have shown that these species possess relatively thick eardrums with a cartilaginous disc immediately deep to them, which could potentially be adaptations for underwater hearing. When male tungara frogs call to attract females for mating, female tungara frogs approach the call initially in air and then in water. Such behavior led to the hypothesis that the auditory morphology of tungara frogs also contain specializations. To test this hypothesis, we used photographic dissections, resin histology and microCT images to screen the structure of the middle ear of the tungara frog. We observed that the eardrum is visually indistinguishable from the skin of the rest of the body, that the eardrum is relatively thick, and that the extrastapes is very broad at its attachment to the eardrum, forming a cartilaginous disc. These features more closely resemble the ear structures of underwater specialists than the ear structures of terrestrial specialists. The observations are evidence that underwater hearing is of high importance to tungara frogs and strengthen the evidence that a cartilaginous disc in the middle ear is an adaptation for underwater hearing. Since the tungara frog can hear both in air and in water, its auditory morphology can help reveal the design features that are key for effective hearing in each medium.

Table # 10

Effect of cations on the melting behavior of a triplex DNA

Mingheng Ling, Siwen Wang

Faculty Mentor: Liang Xu

Three-stranded (triplex) DNA is a unique DNA structure formed when a DNA or RNA oligonucleotide specifically binds to a homopurine region of DNA via Hoogsteen hydrogen bonds in the major groove (Figure on the right). After first observed in 1957 by Felsenfeld et al.,[1] the formation of triplex DNA has been recognized as a novel strategy for genetic manipulation. It is used to inhibit DNA transcription and replication, generate site-specific mutations, cleave DNA, and induce homologous recombination.[2]

However, triplex DNA is not as stable as its duplex counterpart under physiological conditions. Short DNA triplexes often melt below room temperature, making it difficult to study their corresponding properties under normal conditions. In the present work, we studied the thermal denaturation of a 22 TAT DNA triplex at various salt conditions. The melting curves reveal a clear phase transition and the melting temperatures (T_m) increase as a function of increasing cation (Na^+, K^+ and Mg^{2+}) concentrations. Our results show that T_m values above room temperature can be obtained at high cation concentrations. The binding of neomycin to this triplex DNA was also investigated at suitable salt conditions determined by our experiments.

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Table # 11

Noise-Modeling

Chandani Khana, Justine Beyer, Kori Jones, James Kamada

Faculty Mentor: Stacie Hooper

Energy development is a growing industry in Wyoming, and Greater Sage-Grouse (Centrocercus Urophasianus) populations appear to be declining in areas near development sites. The overall goal of this project is to develop a model for understanding whether industrial noise has played a significant role in these reductions by impacting nesting success and attendance at communal breeding grounds called leks. We are using a software package called NMSim (generously provided to us by Blue Ridge Research and the National Park Service) to build a computer simulation of noise propagation across the landscape in our study area, the Pinedale Anticline in southwestern Wyoming. NMSim uses frequency and amplitude measurements from noise sources (drilling rigs and wells producing natural gas in our case), topographical data, and measurements of other factors affecting sound propagation to build a spatially-explicit model of sound propagation. We know that atmospheric conditions affect sound propagation (Wiley and Richards, 1978), so we included the effects of wind, atmospheric temperature, and humidity in our noise modeling approach for sage-grouse. It is unclear, however, how much sound absorption by the ground affects sound propagation in our study area. Greater sage-grouse males display on leks in the early spring (mid-March to the end of April); females then leave to build nests and raise chicks a few miles away. In early spring the ground is often covered by a foot or more of snow, but by the time females build their nests in April and May, the snow is gone, exposing the soft, powdery dirt. Snow is an acoustically soft surface, meaning that it absorbs most sound waves that hit it, rather than reflecting some back into the air as soft dirt does. In this experiment, we compared noise levels at leks and nests using two different values for ground absorption: soft dirt and snow. We did this by simulating noise from drilling rigs present in the study area in 1998 and 1999 under snow-covered ground and exposed dirt conditions and measuring the noise levels that reached sage-grouse lek and nest locations. We repeated the simulation for the same time periods using producing wells, which have a very different sound profile (both frequencies and amplitudes) than drilling rigs. Our results will tell us whether the presence of snow on the ground affects the levels of noise which reach nearby sage-grouse leks and nests. Our results will also inform us as to whether we need to include this variable in our noise-modeling approach for sage-grouse.

Table # 12

The Relationship Between Whistle Structure and Behavioral Context In Bottlenose Dolphins

Mina Afnan, Yeona Lee, Eileen Rad

Faculty Mentor: Stacie Hooper

Bottlenose dolphins (Tursiops truncatus) create sound such as whistles, clicking, squeaking, creaking, and buzzing clicks by producing air movements in the nasal passage. We expect there to be a correlation between the structure of whistles and affective or emotional states because of previous theories such as Morton's motivational-structural rules which hypothesized that mammals produce low-frequency (wide bandwidth) sounds when in aggressive or hostile circumstances and high-frequency (narrow bandwidth) sounds in a fearful context. For example, a mother dolphin produces a vocalization called a "thunk" (broad-band burst-pulse vocalization that sounds like a machine gun) in contexts where her infant has wandered too far and she is urgently signaling it to return to her. The purpose of this project was to explore the relationship between captive bottlenose dolphin whistles and behavior in specific social contexts and emotional states. We recorded two male dolphins, Avalon and Brisby, and their mothers, Chelsea and Jasmine, several times a week from infant's birth through their first year of life using an underwater hydrophone. Recording sessions lasted 30 minutes each; the behavior of all individuals was recorded continuously along with their vocalizations. The dolphins were housed at what was then Marine

World Africa, USA in Vallejo, CA (now Six Flags Discovery Kingdom). We converted the recordings from analog to digital format and analyzed them using Audacity sound analysis software. Then, we compared our measurements of the dolphin whistle structure across different behavioral contexts to determine if there was a relationship. Analysis is ongoing, but we expect to find what whistles produced in different social contexts, such as aggressive interactions or sexual play, will be different in their acoustic structure. The results of this work will help us better understand the kinds of information contained in dolphin vocal signals.

Table # 13

Effects of Nutrition on Developmental Plasticity of Growth in Wing-Dimorphic Crickets

Janice Park, Carolyn Pak

Faculty Mentor: Zachary Stahlschmidt

Given its impact on fitness, variation in animal body size has long been a source of interest for biologists . Body size and other important related traits, such as developmental rate and survival, may be determined by the developmental environment (a.k.a., developmental plasticity). Thus, we determined the effects of diet treatment (low- vs. high-density of calories) on the survival, growth, developmental rate, and overall body condition of two types (morphs) of sand field cricket (Gryllus firmus)—short-winged morphs invest in reproduction at the expense of flight capacity, and long-winged morphs invest in flight capacity at the expense of reproduction. Crickets of each treatment group were reared on a diet of either low-density (10% cat food and 90% bran) or high-density (90% cat food and 10% bran) throughout their entire development. At adulthood, aspects of growth were observed by measuring head width, femur length, and body mass. Contrary to our expectations, crickets reared on the high-density diet took approximately 20% longer to develop—potentially because crickets may not have evolved the ability to safely and efficiently process large amounts of protein found in the high-density diet. Wing morphology also

influenced developmental rate where long-winged crickets developed slower, which suggests investment into flight musculature may constrain developmental rate. Overall, females were larger, heavier, and in better body condition while males had wider heads, which aligns with theories of sexual dimorphism—larger females can lay more eggs while males with larger heads (and, thus, larger mouthparts) can win more fights with other males to increase their mating success. In the future, we will examine how these factors (diet, wing morphology, and sex) influence investment into other important traits (e.g., immune function and reproductive effort) to gain insight into the developmental plasticity of traits and trait-trait interactions.

Table # 14

How does stress influence performance anxiety in field crickets?

Amrita Ramiya

Faculty Mentor: Zachary Stahlschmidt

Mating behavior is of critical importance to animals. Yet, stressors (e.g., limited resources for food, shelter, or water) may inhibit animals from engaging in reproductive behaviors to ensure survival (e.g., foregoing mating to reduce the risk of predation). Due to the stress of being exposed and without shelter, field crickets alter decisions related to mate choice and egg-laying—yet, the effect of such a stressor on mating activity is unknown. In the short-winged sand field cricket (Gryllus firmus) individuals were isolated for the first 4 or 8 days of adulthood. During isolation, half of the crickets had shelter (egg crate) while the remaining crickets were exposed to their individual containers. At the end of isolation, male-female pairs were established to solicit overnight mating. We predict that crickets exposed (non-sheltered) during isolation will exhibit reduced mating frequency given the stress of exposure before and during mating opportunities. We also predict that older crickets (i.e., those isolated for 8 days) will exhibit increased mating frequency given their reduced number of lifetime mating opportunities. Our results will provide new insight into the interactive effects of two

widespread factors (age and stress) on mating success.

Table # 15

College of the Pacific Herbarium Abstract

Hans Lee, Su Jee Noh, Alec Tai, Anahi Pelayo, Lan-Anh Ho, Tracy Ho

Faculty Mentor: Mark Brunell

The College of the Pacific Herbarium collects and maintains plant collections mainly from the Western United States area, but also includes European and Central Asian specimens. The major goals of the College of the Pacific Herbarium includes curating and maintaining dried plant collections, electronically data basing those collections, making them available on the Consortium of California Herbaria, and updating plant names and classifications. The herbarium also actively exchanges with the New York Botanical and other herbaria. Plants collected from field work are dried in the drying cabinet before being mounted onto mounting paper. The live plants are placed in between newspapers and then placed inside folders. The folders containing the plants are bound together and compressed. The drying cabinet contains a vent that slowly dries the plants without damaging its shape and form. The plants are left until completely desiccated. Once dried out, the preserved specimens are glued onto mounting paper and stamped with an accession number. Before entering the database cabinets, the specimens are placed inside a heavy duty freezer, which naturally kills any harmful insects. Even after being placed inside database cabinets, the plants are constantly monitored.

The specimens are digitally databased and organized by their species, family, and subspecies. The database contains additional information including updated species names, collected country, habitat, coordinates, elevation, collectors, and locality. Even after being databased, the information is updated as scientist make new findings. In the future, the Pacific Herbarium could provide important information on a wide range of studies. People would be able to reference plants in order to update taxonomy and study botanics, invasive species, and plant and population trends. Furthermore, plants may be used to develop new cure for diseases and improve food production.

Table # 16

The acoustic performance of the middle ear in túngara frogs, Engymostops pustulosus

Kristie Huie

Faculty Mentor: Marcos Gridi-Papp

Thin eardrums and air filled middle ears are crucial for airborne hearing in vertebrates because they match the low impedance of air with the high impedance of body fluids. These specializations are unnecessary underwater where sound can transfer directly from the medium to the body tissues. The eardrums of frogs tend to be thin in species that communicate in air and thick in subaquatic species. A cartilaginous disk is commonly found deep to the skin of the ear in subaquatic species. Túngara frogs communicate with sound both in air and underwater. Their eardrums are thick and undifferentiated from the rest of the skin, and a preliminary examination revealed a cartilaginous disk in the middle ear We examined the hearing performance of túngara frogs in air, looking for biases caused by the expanded middle ear cartilage. We recorded the bulging of the eardrums in response to sound using a laser Doppler vibrometer. The eardrums vibrated the most within $1.5 - 6$ kHz reaching velocities of 1.0 mm/s, being well within the range observed for small terrestrial frogs. The vibration response was impressively linear within a range > 70 dB, which is beyond the hearing sensitivity range recorded from the brain of this animal. The slope of the response to sound pressure was nearly constant within 1.5-6 kHz. Male túngara frog calls may contain a "whine" at 700 Hz and a "chuck" at 2500 Hz. The chuck is within the range of most linear response and highest sensitivity of the eardrums, whereas the whine is not. The expanded middle ear cartilage of túngara frogs does not hinder its eardrum sensitivity in comparison with other frogs. Our

data indicates that their eardrums are tuned to the chuck but not the whine in air, although this could be modified underwater.

Table # 17

Triggers of Oviposition in Túngara Frogs

Ariana Shulman, Brittany Watu

Faculty Mentor: Marcos Gridi-Papp

Frogs tend to breed when the environmental conditions are favorable for the development of their offspring. Many studies have shown the effects of temperature and rainfall in the seasonal breeding behavior of frogs. At a more immediate time scale, several abiotic and biotic factors have been shown to influence the males' propensity to call, but little is known about the environmental factors that trigger oviposition in females. We carried out an experiment with a captive colony of túngara frogs to discover the relevance of water, male calls, and contact with males as triggers for female oviposition. We placed 12 female túngara frogs per trial into individual sound proof breeding chambers and exposed them to wet moss or water as substrate, having silence or male calls for acoustic stimulation for 48 hours. Each experiment was followed with 24 hours of exposure to male calls and a real male with a substrate of water. During the entire study, the remaining breeding females in the colony were housed with moss and males but no sound or water. Oviposition rates were 58% with a male and water, 18.52% with water and call, 16.2% with water only, 3.45% with moss and call, and 6.67% with moss only. Only two egg masses were dropped in the colony during the entire study, 1.67%. The importance of direct contact with the males might actually be smaller than than previously thought. While the majority of egg masses were laid with a male, the lack of oviposition in the rest of the colony and the occurrence of oviposition without a male in the individual soundproof chambers indicates that although the presence of a male is the strongest trigger there are other factors that can stimulate oviposition.

Table # 18

The effect of pH on substrate preferences in the túngara frog (Engystomops pustulosus)

Anais Tsai, Betty Lee

Faculty Mentor: Marcos Gridi-Papp

2015 Pacific Fund Summer Undergraduate Research Fellowship Project

Acidification of the habitat, often through processes of acid deposition, has been a contributing factor toward recent declines in amphibian populations. Amphibians tend to be relatively acid tolerant, yet their semi-permeable skin allows slight decreases in substrate pH to negatively impact their survival fitnesses. Nevertheless, acidic elements like Sphagnum moss are commonly used as substrates for captive amphibians. We examined the substrate preferences exhibited by the túngara frog in tanks containing two options of bedding laid side by side. We made 252 tests comparing Sphagnum moss (pH 4) and coconut fiber (pH 5); 28 tests comparing coconut fiber with neutralized moss (pH 7); and 48 tests comparing Sphagnum moss (pH 4) with neutralized Sphagnum moss (pH 7). Our results revealed that juvenile túngara frogs prefer the coconut fiber over moss, but the preference is reverted if the pH of the sphagnum moss is neutralized. The importance of pH was confirmed by a strong preference for moss with neutralized pH over regular moss. Adults also showed a preference for the more neutral coconut fiber, but it was much weaker than in juveniles. Túngara frogs are tropical forest litter dwellers and one could expect them to cope well with acidic substrates. The clear preference of their juveniles for bedding with neutral pH indicates a potential fitness cost to exposure to substrates with low pH. Caution should therefore be exercised in the use of Sphagnum moss or coconut fiber with non-neutral pH as the single substrate in the husbandry of amphibians.

Table # 19

Steered Molecular Dynamics Design

Jung In Choi

Faculty Mentors: Charles McCallum

Graduate Student Mentors: Ferdiemar Guinto, Wei Zhang

Steered Molecular Dynamics (SMD) is a method that allows direct interaction with a molecular dynamics (MD) simulation. Forces may be applied in a constant-velocity or constant-force manner. The amount of work done in such an application depends on the reversibility of the forces, as dictated by thermodynamics. This research will use SMD in order to explore how a small peptide responds to being pulled, both directly and indirectly through the non-covalent attractions to a sodium ion. We find that the work is maximized when the pulling force is the smallest and/or slowest, and we observe changes in secondary structure of the helical peptide though its hydrogen bonding patterns. The helical peptide extends in a fundamentally different way whether it is pulled directly or indirectly through the sodium ion.

Table # 20

Synthesis of Uncommon 6,6-linked Disaccharides Analogs

Bianca Rojo, Sung-Hun Cho

Faculty Mentor: Andreas H Franz

Graduate Student Mentor: Sven Hackbusch

Unexplored disaccharide analogs for future studies of their biological functions as glycosidase inhibitors were investigated. In particular, uncommon 6,6-linked disaccharide analogs bound by ester, thioester, and amide functional groups were prepared and characterized. Synthesis of the 6,6 ester linked disaccharide was performed via a Lewis acid-promoted ring opening of tri-O-acetyl-β-glucopyranurono-6,1-lactone using benzyl-2,3,4-tri-O-benzyl-ß-D-glucopyranose as the nucleophile. The 6,6 thioester linked disaccharide was attempted by converting 1,2,3,4-tetra-O-benzyl-ß-D-glucopyranose into 1,2,3,4-tetra-O-benzyl-ß-6-thioester D-glucopyranose under Mitsonobu reaction conditions. Synthesis of amide linked disaccharides was also attempted by attacking 1,2,3,4-tetra-O-benzyl- ß-D-glucuronic acid with 1,2,3,4-tetra-O-benzyl- 6-amino-ß-D-glucopyranose. The resulting products were analyzed and characterized using ElectroSpray Ionization (ESI) mass spectrometry and Nuclear Magnetic Resonance (NMR) spectroscopy.

Table # 21

De novo Design of Homodimerizing Protein by use of the Knob-Socket Model

Zaina Chaban, Alex Hussar

Faculty Mentor: Jerry Tsai,

Graduate Student Mentor: Shivarni Patel

The knob-socket model aids in the identification of packing in protein secondary, tertiary and quaternary structure. First, the intra-helical packing patterns are first identified as a regular grid of 3 residue cliques or sockets connected by the peptide bond, a hydrogen bond, and van der Waals interactions. For interactions between helices, the tetrahedral knob-socket motif involves the single residue knob from one helix that packs into a socket coming from a different helix. Because amino acid composition of sockets and knob-sockets has shown preferences, the knob-socket model can be used for the de novo design of an anti-parallel homodimerizing, alpha-helical protein named KSa1. By utilizing histidine-tagged affinity chromatography, KSa1 confirmed knob-socket model's applicability in the the design of a helix. Since the protein designed was so short in length, affinity chromatography after cutting off the histidine-SUMO tag was not with our current resources. To facilitate purification and therefore further study, KSa2 was designed that effectively duplicates the helix, so that the packing interactions between 2 helices occur within a protein chain. Using the current plasmid for KSa1, a restriction enzyme will be used to cut the plasmid allowing for insertion of a small linker and second KSa1 helix sequence. By

adding a linker and second helix, the expressed protein for KSa2 should interact with itself, allowing for observation of not only the helical structure, but also the knob-socket interactions. Assuming DNA sequencing for the transformed plasmids showed the appropriate insertion of the additional sequence, visual confirmation of the structure could be confirmed through circular dichroism and protein Nuclear Magnetic Resonance experiments.

Table # 22

Characterization of Zinc Oxide Quantum for the purpose of Solar Cells

Sean Nakada

Faculty Mentors: Ryan Moffet, Seth Feldman

Graduate Student Mentors: Matthew Fraund, Don Pham

Quantum dots are nano-sized particles, which can act as semiconductors that can be used in photovoltaic devices. The wavelengths absorbed by quantum are dependent on the composition and size. A commonly used quantum dot is made from a Cadmium Selenide compound, but this system has two major issues. First CdSe is toxic. Second the production cost can be expensive which presents a major obstacle for scaling up production. The goal of this project is to characterize a cheap, non-toxic alternative to CdSe. In this experiment, Zinc Oxide, Quantum dots were synthesized and were characterized using UV/Vis spectroscopy, and transmission electron microscopy (TEM). UV/Vis spectra shows what wavelengths of solar light are being absorbed this has a direct correlation to the size of the particles because of the quantum confinement of the excitons. When photons are absorbed excitons are created along with quasi particles called "holes", these particles are made in pairs and require a level of confinement energy to create them. The smaller particles the stronger the confinement energy, resulting in smaller quantum dots absorbing smaller wavelengths of light. Transmission electron microscopy then confirms the morphology of the Zinc oxide particles.

Table # 23

Frog Fondness: Bloodfeeding Patterns of Neoculex Mosquitoes

Ashley Abraham, Dakota Smith

Faculty Mentor: Tara Thiemann

Mosquito collection is an integral part of monitoring disease prevalence. Most standard trapping devices to capture mosquitoes utilize light sources or CO2 baited traps to capture host-seeking mosquitoes. Some species, however, are not attracted to these collection methods. In Lake County, California, three of these species exist as a part of the Neoculex group. A collective 228 mosquito samples, each belonging to one of three Neoculex species: Culex apicalis, Culex boharti, or Culex territans, were collected with a vacuum aspirator by the Lake County Vector Control District in 2014-2015. Following DNA extraction, a nested polymerase chain reaction was completed to amplify a 658 base pair region of the mitochondrial gene, cytochrome c oxidase I. The sequenced DNA were utilized to identify its respective source species. The results demonstrate a strong preference in feeding patterns for Pseudacris sierra, colloquially known as the Sierran Tree Frog. The feeding preference observed in this study can be exploited to create a more effective collection method for future detection efforts by utilizing frog calls and positive phonotaxis to capture these species for future monitoring efforts – which is critical since Culex apicalis has been detected carrying West Nile virus, and is capable of carrying malaria.

Table # 24

Life history is correlated with population structure in endangered Bay Area butterflies

Katy Abraham, Vida Bao

Faculty Mentor: Ryan Hill

Speyeria coronis and *S. callippe* are both species native to the San Francisco Bay Area and western states generally. Both species reside in the same habitat, under similar living conditions

and using the same resources. The species are similar in many ways, yet *S. callippe* has a federally listed endangered subspecies (*S. c. callippe*) whereas *S. coronis* has no endangered subspecies. Dramatic differences in the life histories of these two species could be the key to understanding both why *S. callippe* and other *Speyeria* have endangered populations, and how to develop conservation plans to restore *S. c. callippe*. In the Bay Area, *S. c. coronis* experiences a reproductive diapause, where after mating in early summer the females fly about seeking flower nectar and live for 3-4 months. In the fall, their ovaries mature and they are able to lay eggs on their chosen host plant. In contrast the life cycle of Bay Area *S. callippe* populations (*S. c. callippe* and *S. c. comstocki*) are very different and lack a reproductive diapause. Instead, the females lay their eggs directly after mating in early summer, often in the same area the parents hatched from, and live only a few weeks. This difference in life histories suggests a difference in genetic diversity between the two species, with *S. callippe* persisting as relatively isolated, genetically distinct subpopulations, and *S. coronis* in contrast persisting as one large population and showing little population structure. The purpose for our research project is thus to answer the question of how the differences in breeding patterns in *S. coronis* and *S. callippe* are reflected in the genetic structure of the two species

Table # 25

Bloodfeeding Patterns of Culex tarsalis and Culex pipiens Mosquitoes in San Joaquin County

Kevan Shergill

Faculty Mentor: Tara Thiemann

West Nile virus (WNV) is a zoonotic virus that causes flu-like symptoms, encephalitis, and sometimes death, in humans. The virus was first detected in the eastern hemisphere in the 1930s, and it was introduced to the United States in 1999. The virus spread relatively quickly across North America and reached California by 2003. Since then, there have been 4,805 reported human cases with 176 cases resulting in death.

Many bird and mammal species act as a host for the virus in California, and the virus can then be transmitted to other species by two primary vectors: Culex tarsalis and Culex pipiens. The bloodfeeding pattern of these mosquitoes is an important component in WNV transmission. To better understand these patterns, a total of 614 specimens of Cx. tarsalis and Cx. pipiens were collected from twelve different habitat types in the San Joaquin County between August 2009 and November 2012. Bloodmeal DNA was extracted from each mosquito and a 658-base pair region of the mitochondrial cytochrome c-oxidase I (COI) was amplified using polymerase chain reaction (PCR). Successful amplifications were then sequenced, and the resulting sequences were submitted to BoldSystems, an online DNA barcode database, for species identification. Over 80% of the bloodmeals were successfully identified. There were 77 different host species: 44% were mammalian and 56% were avian. The most commonly fed upon species by Cx. pipiens and Cx. tarsalis were cattle (11.70%), house finches (8.97%), and American robins (6.25%). The majority of bloodmeals were collected from riparian (n=84) and agricultural (n=77) habitats. The data from this bloodmeal study shows the local feeding patterns of the two most common vectors of WNV in California based on habitat type, location, and seasonal factors, giving insight into local transmission of WNV.

Table # 26

Comparing the immature stage morphology of Speyeria callippe subspecies to assess convergence in adult phenotypes

Grace Chang, Ashley Koh, Lily Tieu, Leanne Tran

Faculty Mentor: Ryan Hill

Speyeria butterflies are polytypic species with many subspecies varying extensively in color pattern. In California, Speyeria callippe alone has 13 subspecies, and ranges widely from southern California up the coast range and across the mountains of the Sierra Nevada and Cascades. The polytypic nature of Speyeria is

exhibited in California S. callippe by the patchwork geographic distribution seen in subspecies with similar adult phenotypes, S. callippe adiasteoides is similar to S. c. juba and S. c. macaria/laurina; whereas S. c. liliana is similar to S. c. elaine. This could be explained by these taxa being relatively closely related compared to their neighboring populations. However, focusing on adult phenotypes to understand relationships may be misleading because of selection for crypsis or mimicry. Thus, this study focused on comparing the immature larval stages (caterpillars) of these S. callippe taxa to test whether they are close relatives or not. Previous studies in our lab showed differences in larval morphology between the Coast Ranges, Siskiyous/Cascades and Sierra Nevada but this was based on samples from few populations and data were not available for S. c. liliana. Here we examine additional populations, including sampling S. c. liliana, to test whether larvae from the same geographic region are similar. If S. c. adiasteoides, S. c. juba and S. c. macaria/laurina are more closely related, and if S. c. liliana and S. c. elaine are more closely related, they should have similar larval stage patterns as well as adult phenotypes. However, if the larvae are similar in geographically adjacent regions, we would conclude that the adult phenotypes are convergent.

with only two recognized surviving populations. While there has not been extensive research on the exact reasons for decline, evidence suggests that the decline is due to growing urbanization and recreational use of the butterfly's habitat. Human caused population extinctions lead to a reduction in population connectivity and genetically separated populations of S. callippe. However, populations may also be naturally subdivided with genetically separated populations, making it difficult to know what is natural for the species. For example, putatively fragmented populations in the San Francisco Bay Area may be just as connected as populations in relatively undisturbed parts of California's north and south coast ranges that are naturally subdivided. Our goal is to establish whether S. callippe population structure has been impacted by human habitat alteration to help guide management of this species. If human habitat alteration has caused a change in population connectivity in the Bay Area, then there should be more population differentiation there relative to north and south coast range populations. Using the mitochondrial gene cytochrome oxidase subunit I, haplotypes will be analyzed to highlight the differences within and among areas. Analysis of Molecular Variance (AMOVA) and Fst will be used to assess genetic variation to confirm or refute our suspicion of population fragmentation in the Bay Area.

Table # 27

Do Speyeria callippe populations show effects of human habitat disturbance?

John Hitzfield, Stuart Adam

Faculty Mentor: Ryan Hill

Speyeria butterflies have been experiencing a decline due to habitat disturbance by humans. Unlike larger endangered animals, Speyeria is not acutely affected by factors such as over collecting, but more so by loss of food and land resources, such as its host plant Viola pedunculata. In particular, the Bay Area has been prone to extensive development and encroachment by humans, and S. callippe callippe has consequently been classified as a Federally Endangered Species since late 1997,

Table # 29

Knob-Socket Mapping of a-Helical Proteins

Alisha Cheng

Faculty Mentors: Jerry Tsai, Hyun Joo

Current maps used for designing helical proteins are extremely limited in their ability to display the location of the proteins and inter- and intra-helical relationships between the proteins, thus making it difficult to design new proteins on paper. Here we present a new method of mapping out helical proteins: the Knob-Socket map. This new map lays out the entire protein helix on a 2-D map, displaying the bonding structure between the amino acids. The shading patterns displays the interaction between the

separate helices. Using the Knob-Socket map, we can not only clearly map out proteins, but we can also study the effects the specific observed bonding patterns have on the proteins, where interactions might take place, as well as the folding patterns of the protein. As shown here, the α-helical coiled map shows interval clusters of knob-socket interactions, which is characteristic of the crossing-over of the helices. It is also possible to show the order in which the helices are in.

Table # 30

Knob Socket Analysis of Beta Amyloid Proteins

Jihee Yoon, Irene Lang

Faculty Mentors: Jerry Tsai, Hyun Joo

Alzheimer's disease is an irreversible brain disorder that gradually destroys memory, critical thinking skills, and the ability to carry out simple tasks. Currently, this disease affects 5.2 million Americans. Alzheimer's has been characterized by the formation of beta-amyloid peptide plaques between nerve cells in the brain. Analysis of the three-dimensional tertiary protein structure is a challenge, but could result in better development of therapeutic and diagnostic tests. The knob-socket model simplifies the complexity of three-dimensional packing of protein residues into an easily interpretable two-dimensional map. The resulting topology map of tertiary structure clearly indicates how the amino acid residues interact with each other as a group and individually. The local set of amino acid residues form a three member socket, while a non-local residue is defined as the knob that packs into the socket. The Alzheimer disease state has been shown to be caused by prion amyloids, and structural information about these amyloids have been solved for the protein crystals 2LMN and 2LMP. Using the knob-socket model, packing topology maps were constructed for these amyloid states. These topology maps identify potential areas on the exposed amyloid surface that could interaction with a diagnostic peptide to identify early stages of the disease. Also, the exposed edges offer areas of interaction to inhibit further extension of the prion state and therefore

a potential therapeutic by preventing amyloid plaque growth. The next steps are to synthesize these peptides that target the amyloid structure and test their binding ability and inhibition of amyloid plaque accumulation.

Table # 31

Blood Meal Analysis of Culex thriambus and Culiseta particeps

Alan Williams

Faculty Mentor: Tara Thiemann

Mosquitos are common vectors of diseases such as West Nile Virus (WNV). While there has been significant research on some California vector species such as Culex tarsalis and Culex pipiens, relatively little research has been done on Culex thriambus and Culex particeps, two resident species of mosquito in California that may contribute to the spread of diseases. By accurately determining the feeding patterns of these species we can attain a better understanding of what possible roles they play in the transmission of pathogens. Bloodmeal analysis was conducted by extracting DNA from bloodmeals of the abdomens of female mosquitos then subjecting it to targeted nested PCR and DNA sequencing of mitochondrial cytochrome c oxidase I which enables accurate identification to a species level. Bloodmeal analysis of these two mosquito species collected from Lake County, California in 2014-2015, shows us that Cx. thriambus and Cs. particeps feed on a combination of avian and mammalian hosts.

Table # 32

Locomotor mimicry among unpalatable butterflies

Kelly Inuzuka

Faculty Mentor: Ryan Hill

Predation is an important ecological interaction among species that involves strong selection to shape species phenotypes. Color pattern phenotypes may be adapted to reduce predation

through crypsis, blending into the environment, or by being brightly colored and advertising that they are defended, using warning coloration. Mimicry is when multiple species evolve to use the same warning/advertising signals, and closely resemble one another. In some cases an undefended prey mimics a defended prey species and this is called Batesian mimicry. By imitating a defended species that predators have learned to avoid, the undefended prey has an increased chance of survival. In other cases, multiple defended species resemble one another, which is called Mullerian mimicry. By imitating the same signal, there is a reduction in the number of prey consumed to train the predators. Research with predators indicates that when choosing prey they pay attention to not only color pattern, but behavior as well. This predicts that mimetic species should converge in not only color pattern, but also non-color pattern morphology and behavior, such as flight morphology and kinematics. Studies have confirmed this in a couple species, but behavioral mimicry in morphological and kinematics is generally understudied. Previous work in our lab focused on a community in the Amazon basin composed of over 60 species involved in Mullerian mimicry. This work analyzed males and females separately and found that morphology converged among mimicry complexes. In addition, males were similar in flight, with wing beat frequency converging among mimicry complexes, however females were not tested. Here we investigate the flight kinematics in female ithomiine butterfly species from a single community to test whether they converge among mimicry complexes.

Table # 32

Characterizing Bay Area Speyeria butterflies: what is S. zerene sonomensis?

Lindsay Wourms, Danish Farzad

Faculty Mentor: Ryan Hill

The adult color patterns of many Lepidoptera vary significantly both from region to region and also within subpopulations. Identification to the level of subspecies during field studies may be difficult due to the similarity in color patterns of different subspecies within the same habitat. This is particularly relevant in studies of declining Speyeria butterflies, where species look alike locally and matching the local variants to regional species can be a challenge. An example in the Bay Area needing study is S. zerene sonomensis. Speyeria zerene is a species with multiple endangered subspecies along the coast of Northern California and Oregon. S. z. sonomensis was described as a distinct subspecies located in Sonoma county in areas impacted by agriculture and development. However, it has not been clear whether it actually belongs to S. zerene or instead is a subpopulation of another species, Speyeria coronis. These species are confusingly similar in parts of their range and appear to overlap in phenotypes in the Bay Area, opening the question of whether the taxonomy is correct. We are therefore focused here on using the mitochondrial gene Cytochrome Oxidase Subunit 1 (CO1) to test the validity of current taxonomy for Speyeria populations in the Bay Area. There are three alternatives for the status of S. z. sonomensis: 1) the described S. z. sonomensis is actually a population of S. coronis, 2) it is actually a population of another Speyeria species, or 3) that it is S. zerene as currently recognized. To test these hypotheses, we ask two questions, how well does the CO1 gene resolve the different species of Speyeria in the Bay Area, and if it works well, to which species does S. zerene sonomensis belong?

Table # 33

Infinite Families of Subgraphs in Coloring Graphs

Ashley Butts

Faculty Mentors: Larry Langley

The k-coloring graph of G is de fined as the graph whose vertex set is all the proper k-colorings of G with edges between colorings if and only if they diff
er at precisely one vertex of G. Our research seeks to determine properties that indicate whether a graph is realizable as a coloring graph. In our approach we identify graphs that are not coloring graphs by locating minimally forbidden

induced subgraphs, graphs that cannot be an induced subgraph of any coloring graph. This paper will discuss a new in finite family of minimally forbidden induced subgraphs we found. We also examine the formation of edge labeling templates, a new technique we implemented in our research.

Table # 33

Echoes of the Past

Timothy Shumate

Faculty Mentor: John Mayberry

2015 Pacific Fund Summer Undergraduate Research Fellowship Project

The desire for a competitive edge should be familiar to anyone with a passing understanding of sports competitions where victory is paramount. The following project aimed to model competitive games of Water Polo using mathematics and computer simulations to get a competitive edge through understanding the influence of past possessions. Of specific interest was the significance of prior possessions on scoring outcomes. The two types of previous possessions we quantified were: I. Immediate Previous Possessions (IPP) the possession immediately before the current possession. II. Previous Offensive Attempts (POA) The current offensive team's previous possession. Standard confidence interval and sampling procedure were followed along with data analytic methods to form conclusions from our provided water polo data of competitive games. Our findings strongly indicate the influence of IPP in elite, Olympic level Water Polo. These influences amount to the changes in the likelihood to score a goal for the team's next possession. We also indirectly found out that POA did not significantly affect the goal-scoring potential in the current offensive team's next possession. As one team's POA is another team's IPP based on a shift on perspective, we can say IPP are important for a water polo team's offensive consideration, while POA are important for defensive consideration at the Olympic level. We also have mathematically accurate simulation programs for water polo based on our data to extrapolate further.

Componi Brewing System

Juan Abundes, Shahad Alsehli, Xiaodi Li, Neil Reiher

Faculty Mentor: Suzanne Walchli

The idea behind the "Componi Brewing System" is to use a combination of coffee brewing systems and incorporate them together to create a system that focuses on the options of multiple pod usage, a mug cleaning system, and an integrated Bluetooth user interface. These features are integrated into one sole product named "Componi Brewing System." With over 60% of the United States population drinking coffee every day and a global coffee sales market of $42.5 billion, there is large market potential for this product. In addition, there has been rapid growth in recent years of home brewing systems. The idea behind "Componi Brewing System" is to improve upon the systems currently available on the market by enabling the consumer to make hassle-free, high quality coffee at home at a scheduled time. The unit also offers the flexibility to use multiple pods to make the volume and blend of coffees desired, the ability to set features from a smart phone, and the convenience of a built-in cup cleaning system. Preliminary market research conducted through surveys and focus groups allowed us to focus on a target market of consumers between the ages of 18-45 years old who are students and working individuals. Individuals with busy lifestyles and who make coffee at home are consumers who would benefit from the "Componi Brewing System." The go-to-market strategy for the product will be further evaluated through an in-depth patent and trademark search and a net present value analysis of product revenues and costs. The product will be released in The United States due to high coffee consumption rates and high target market population.

Hawt Dayum

Lea Baron, Mario Arreguin, Max Huston, Kristen Wong

Faculty Mentor: Suzanne Walchli

Hawt Dayum is a drop you eat to relieve the stress of spicy food. Made of casein, Hawt Dayum is filled with a soothing liquid that instantly calms your tongue from the burn. Hawt Dayum will initially come standard in a mint flavor but will also be offered in different taste options to compliment any hot meal and any type of cuisine. The flavors that will be available are: Horchata, Coconut milk, Green tea, Vanilla Cardamom, and Soda. It is important to add that our product is dairy-free, thus it suits lactose intolerant people as well. No one wants to ruin the taste of a good meal after burning one's sense of taste because the dish ordered was too much to handle. It is popular knowledge that products such as milk, bread, and alcohol help with that pain; however, nothing on the market can instantly soothe this feeling like Hawt Dayum! The following market trends support the potential for Hawt Dayum: Studies showed that spicy food has risen in popularity and now is one of the most profitable trends in the food market; 53% of U.S. shoppers like hot and spicy foods, rising to 58% for Generation Y; Between 2012 and 2017 sales of ethnic foods in grocery stores will grow more than 20 percent ; 70 different spicy food items in chain and independent restaurants grew in popularity between 2008 and 2012; 37% to 40% of customers want to continuously try new restaurants, and a Technomic survey found that people seek "innovative flavors" when trying new restaurants.

Nothing To Wear

Momori Hirabayashi, Kevin Wong, Jonathan Collins, Rachel Robichaux

Faculty Mentor: Suzanne Walchli

Our product is a smart phone application that employs body recognition software to allow the user to virtually try on clothing based on their dimensions. It also aids the user to assemble outfits and choose clothing based on the weather for the day. We believe our app is a great idea because there has yet to be a fashion app that simultaneously generates different combinations of outfits to wear and analyzes the suitability of them for the day's weather. We have identified

a strong consumer need of wanting great fitting clothing while staying up to date with the latest trends. The app eliminates the hassle of trying on clothes – at home or while shopping at stores -- and empowers the user to make sure he or she looks the best with a swipe of a finger. We will acquire the body recognition technology through licensing the software. It has been developed and has been widely used in apps such as Snapchat. Also, we will acquire the weather forecast capability from pre-existing applications. We will negotiate the terms for this acquisition and expect to get a good price because there are many different weather applications on the market. After we acquire the intellectual properties stated above, we will be on our way to building our app. We will develop our own proprietary technology/formula for generating different outfits. To fund our initial app development, we will attempt to obtain crowd funding. Once we gain the funds to develop an initial prototype we will approach clothing retailers as potential partners. Because our research has shown that consumers will only pay a nominal fee for this type of app, our goal is to develop a revenue stream from promoting partner company's clothes and also by taking advertisements.

Gym Check System

Mushel Kazmi, Sydney Stanfill, Sarah Nitschke

Faculty Mentor: Suzanne Walchli

This project focuses on the development of a system to allow gym users to check on the current crowding conditions at their favorite gym. The Gym Check system is a mobile application that will allow gym users and management to see the amount of overall traffic and individual equipment availability in their gym. The Gym Check system combines usage data, machine-tracking technology, and check-in information to provide a user-friendly interface for both gym-goers and gym management. As going to the gym becomes a more prominent part of life in the United States, gyms are facing the increasing problem of overcrowding and inability of supply of equipment to keep up with

demand. The ability to see what is available, what is commonly used, and how many people are around is mutually beneficial to both gym management and gym-goers. Unlike other products, this system provides real time tracking of individual pieces of equipment so that gym-goers don't have to deal with unavailability and waiting, and gym management can manage demand for each piece of equipment. Preliminary market research, including a survey and in-depth interviews with professionals in the industry, shows that crowding and unavailability of equipment are a problem, that demand for such a product is high, and that there are definitely a significant number of people who would download the application.

Collegiate Nightlife App

Matt Lee, Conner Bitzer, Mitchell Guillen, SJ Maeng, Malea Parcasio-Eshelman

Faculty Mentor: Suzanne Walchli

We are developing an app committed to providing our customers with the best of nightlife opportunities. It will allow people to connect in a way that is completely different than Facebook, Instagram, WhatsApp, and other popular apps. When going out for a night of excitement, you want to know what the atmosphere is like wherever you are going. Our app provides an interactive solution to your decision process. The app allows people to check in wherever they are and let others know what the destination is like. People can then look at the app before they go to a bar, club, or lounge, and determine whether or not it will be worth their time to stop by. Not only are we focused on making users' nights enjoyable, but we also save people time and money if their proposed destination isn't what they expected it to be. The most influential reason we believe there will be a large demand for an app such as ours is because of the many benefits it has to offer users. We plan to partner with other consumer services such as Uber, so when customers use the app they can earn Uber ride benefits. Users will also be able to earn rewards such as free drinks from participating bars and restaurants. The other feature that allows us to

differentiate from our competition is a messaging component. After checking into the app, customers can message others who were at the same venues for up to twenty-four hours after check-in.   After conducting our market research, we determined we will be targeting younger adults aged 21-35. We will be targeting this group of people in college towns and large nightlife population cities around the United States in order to provide our services where we believe they are most desired. Not only do we believe that our product will be most successful in these areas, but we also believe releasing our app in these concentrated areas will provide us with the largest potential for rapid word-of-mouth promotion among our target market.

The Effect of Conflict and Violent Television on Stress Levels

Ebubeze Anene, Mati Long

Faculty Mentor: Jessica Grady

The purpose of the current study was to determine whether or not the combination of violent television and a social interaction depicting a conflict has an effect of one's levels of stress. We want to answer the research question "Does the combination of violent television and a conflict interaction cause an increase in stress levels?" This study will involve at least 40 participants. Participants will be told they will watch a short video, and do short task. They will be divided into four groups. The first group is the conflict clip with a conflict interaction (CC). This group will watch a 3 minute Captain America movie trailer while both researchers engage in a brief conflict interaction (arguing with each other). The next group is the conflict clip with a neutral interaction (CN). This group will watch the movie trailer while the researchers engage in a neutral interaction. The next group is a neutral 3 minute news clip with an conflict interaction (NC). This group will watch a neutral weather clip while the researchers engage in a conflict interaction. The last group is the neutral news clip with a neutral interaction (NN). This group will watch the neutral news clip while the researchers engage in a neutral interaction. After the interaction and the video clip ends, the participants will be asked to complete the Perceived Stress Scale. Once they complete the PSS, researchers will have participants watch another video (a video of puppies) and debrief the participants. We hypothesize that there will be a main effect among violent television condition and among the conflict interaction condition with the violent television/conflict interaction groups being the most stressed.

An examination of the relationship between stress and entertainment

Jocelyn Camargo, Ebubeze Anene, Tracy Liu

Faculty Mentor: Jessica Grady

The purpose of this study was to determine if there is a relationship between stress and amount of time spent watching Entertainment. A total of 50 students from the University of the Pacific were interviewed using an anonymous questionnaire. The variables measured were stress and time spent watching entertainment. The survey included 13 items to which participants responded using a Likert-type scale. The results found a significant positive correlation between stress and time spent watching entertainment. The results suggest that stress and time spent watching television are positively related. A limitation of this study is that participants included only University of the Pacific students. Future studies can have a larger sample size that include college students nationwide.

Effect of paper size and condition on recycling

Lois Chan, Aroosa Ahmed

Faculty Mentor: Carolynn Kohn

Graduate Student Mentors: Amir Cruz-Khalili

Nationwide, paper products make up 71 million tons or 29% of municipal waste (EPA, 2016). Trudel and Argo (2013) investigated the association between particular characteristics of paper and aluminum cans on the likelihood individuals would recycle them. In their first series of experiments, Trudel & Argo (2013) evaluated the effect of paper size and cutting of paper and found 82% of participants recycled uncut large pieces of paper; whereas only 44% recycled small pieces of paper. In a separate experiment examining small (7 oz) and regular sized (12 oz) aluminum cans that were either dented or undented, the researchers found ~83% of participants recycled large and undented cans; whereas only ~16% of participants recycled large and dented cans, while ~47% of participants recycled small and undented cans.

However, it is unclear whether individuals are less likely to recycle other types of "damaged" paper (e.g., crumpled). The purpose of the current study is to replicate and extend Trudel and Argo's (2013) methodology. The replication will involve conducting the same study as described, but with the addition of a crumpled piece of paper (i.e., analogous to a "dented" can). Participants will be assigned to one of four conditions based on whether participants cut the paper and whether the paper is crumpled: (1) no cut smooth paper, (2) cut smooth paper, (3) no cut crumpled paper, and (4) cut crumpled paper. To reduce reactivity, participants will not be told this is a study about recycling. Instead, participants will be asked to evaluate a pair of scissors. Results should provide information regarding possible effects product characteristics may have on participants' recycling behavior. Furthermore, reliability of Trudel and Argo's (2013) results will be examined by replicating their methodology. Data will be collected and analyzed to help determine if product characteristics influence participant behavior.

Self-Reported Alcohol Consumption: It Doesn't Add Up

Danielle Cummings, Jade Vo, Erika Brindopke

Faculty Mentor: Carolynn Kohn

Graduate Student Mentor: Molly Hankla

Alcohol use and abuse among college students is problematic, and can lead to several adverse effect (e.g., drunk driving, unsafe sex, death). Universities, including Pacific, often provide alcohol education courses aiming to reduce these problems, and include a self-report component in which students are asked to quantify the number of drinks they consume over a specific time period. Although self-report is generally an unreliable data collection method, it is sensitive to feedback; thus, students' self-reported alcohol consumption often changes following feedback on their free-pours of what they believe to be a standard serving of alcohol. Some research suggests provision of corrective feedback increases the accuracy of students' self-reports. For this type of feedback to be effective, students

must be skilled at completing math calculations quickly and easily. For example, a student might initially report drinking 4 drinks per week and then pour 18oz when asked to pour a standard serving of beer into a cup. When told a standard serving of beer is 12oz, he must be able to calculate (18x4)/12, and adjust his self-reported drinking to 6 drinks per week. This appears to be a significant assumption, which, to date no research has specifically addressed. The current study assessed students' basic math skills as part of a larger study on college student alcohol use. Participants were 43 college students asked to complete a math test including multiplication and division problems without a calculator. Results indicated many students did poorly in completing this task (Mscore=78.6%). Therefore, it's possible changes in students' self-reported alcohol consumption may not be any more accurate following corrective feedback, as many students may not possess these math skills. This research may inform alcohol education courses' curricula, and further supports the literature that self-reported alcohol use is not a reliable primary dependent measure.

The Effect of Videos and Actions on Charitable Behavior

Brianna Fonseca, Keaton Loui

Faculty Mentor: Jessica Grady

When making decisions regarding behavior, things we see in the media or behaviors we see from our peers often inspire us. The aim of this study is to analyze the effects of a prosocial video that is watched, as well as prosocial behavior that is seen from a college student, on how willing participants report they would be to donate to charity. Prosocial behavior is offering help to others. The study will contain 40 participants from the University of the Pacific. Participants will enter the study and watch a video, either the neutral video or the prosocial video, and watch either a neutral or prosocial interaction between the researchers. Then participants will take a survey on willingness to donate to charity. Data are still being collected at this point in time. Keywords: media, charity, donation, peer influence, college students

The Effects of Individuals' Ratings of the Competency of Others with Tattoos and Piercings

Maricruz Lozano, Clarissa Medrano, Heather Mills

Faculty Mentor: Jessica Grady

Individuals with facial piercings have been viewed in previous studies as having lower competency levels (Newman et al., 2005). The researchers conducted a study previously analyzing the effects of piercings on reported trustworthiness. Previous studies have indicated that individuals with tattoos are viewed negatively by employers (Timming, 2015). The purpose of the current study is to build upon previous studies on the effects of tattoos and piercing. It will also analyze the effects of competency rating on individuals with both tattoos and piercings. The researchers hypothesize that both tattoos and piercings will negatively affect individuals competency ratings. The study will include 40 University of the Pacific students that will be gathered using Haphazard sampling. There will be four conditions: piercings only, tattoos only, both piercings and tattoos, and no tattoos or piercings. The same four models will be used for each condition. Competency will be measured through a survey provided to the participants. The researchers believe that there will be a main effect for both visible piercings and tattoos. The researchers also believe that there will be a simple main effect of tattoos on piercings. The current study will inform and bring awareness to individual's perceptions of tattoos and piercings. Key words: competency, tattoos, piercings, experiment

Emotion Displays in Storybooks within American Culture

Katie Perez, Jillian Yelinek

Faculty Mentor: Jessica Grady

Various outlets help children learn about emotions. Storybooks are one of the primary useful tools in this teaching of emotion. Emotion content in picture books varies across cultures and this variation has been a focus of past research (Tsai et al., 2007; Suprawati et al., 2014). In the present study, we analyzed popular story books in the U.S. whose characters and content represent three major ethnic groups within American culture, specifically African American, Asian American, and Hispanic/Latino groups. We examined storybooks geared toward children ages 2 to 3 years. We identified books listed under "Best Sellers" on Amazon.com overall along with books listed as Best Sellers within subheadings listed under "Geography and Cultures" that were advertised as a way to inform children about the three diverse cultures (i.e., African American, Asian American, Hispanic and Latino). Coding is ongoing. For each page of the storybooks, we coded the main character as either showing emotion or no emotion. For each emotion displayed, a discrete emotion label was coded, i.e. happiness, sadness, excitement etc. Each emotion display was also coded for intensity of expression (coded from low (1) to high (3)). The main character's level of arousal was also coded as low (e.g., sitting), moderate (e.g., walking), or high (e.g., running) (Tsai et al., 2007). Each page was also coded for social context. Social context was coded as in-group (familiar others such as parents), out-group (strangers), mixed, or alone (Wege et al., 2014). We expect happiness to be portrayed more than any other emotion across all groups of books. We also expected Asian American picture books to show low emotional arousal compared to books from other groups. Understanding variation in storybooks in American culture may facilitate understanding of variations in how children express emotions.

Composer's Program Notes

Somewhere or Other

Zach Franklin

Christina Rossetti's poetry is quite personal, encompassing a large range of emotions. This poem in particular–pardon the pun–struck a personal chord in me. It is laced with the bittersweetness of not having yet experienced passionate love, yearning for that connection with someone, and wondering where and who your someone could be, which I tried to convey in my harmonic language and use of asymmetric meter.

1933

Jason Thompson

The inspiration behind this piece was a dream. The music is written to reflect the feelings this dream invoked, the title comes from one of the people in the dream who replied "1933" when I asked "what year is it?"

Night Terrors

Jesse McMilin

Description: Eerie and atonal, "Night Terrors" seeks to capture the otherwordliness and the explosive fright of these late-night bouts of sleeplessness and fear.

Arachne – Woven Intricacies

Zach Franklin

This piece, named after the Greek myth of Arachne, is a sonic exploration of the string quartet genre through a peculiar inspiration: spiders. Silly as it may sound, I watched a video of a spider mating dance and I just had to write. I tried to represent the mating dance aspect as well as web-weaving and eating prey, imitating a spider's life.

If spider's and imagery associated with them make you uncomfortable, it is advised that you leave the room to avoid any discomfort.

A Normal Life

Josh Brent

A Normal life is a piece in 4 movements that touches on each section of a person's life. The person portrayed in this piece separated their life into 4 sections. Birth/Childhood, Adolescence, Adulthood, and Old age. The Childhood section is light bouncy and energetic representing the innocence and high energy of a child. The Adolescence movement represents a dramatic teenage time in this person's life. While going through these years the person felt it was the most dramatic time in their life and the music reflects that. The Adulthood movement is very repetitive and reflects the happy tone of this person's adulthood. The repetitive nature of this movement represents the repetitive nature of adulthood. The final movement is a remembrance of their life. Looking back on all 4 stages of their life and in the end listening to them all meld together: A Normal Life.

[i carry your heart with me(i carry it in]

Thomas Ravago

The text used in this choir piece is a poem of the same name written by E. E. Cummings. The unique punctuations of the text guides the organization of the voices, featuring an ebb and flow between consonance and dissonance. The piece begins with the voices in unison, and travels away and toward that unison in the same ebb and flow manner throughout the piece. The voices arrive at the conclusion of the piece in the same way it began- in unison. The song features a few motifs that recur throughout the piece in different shapes and forms. With this ebb and flow motion, the piece takes us through the emotion found in the poem *[i carry your heart with me(i carry it in]*.

Lambadamy

Scott Nelson

Lambada is an Afro-Brazilian dance developed by Africans brought to Brazil as a result of the slave trade. It's a partner dance that involves:

1) Stepping from side to side with arched legs while simultaneously swaying and twisting the hips, and

2) Wearing as few clothes as possible

In the late 1980's, Lambada grew wildly popular, in part due to the success of a song by the French pop group Kaoma entitled "Lambada". And just like with everything else foreign to America, Hollywood grabbed hold of it, made the dancers wear even less clothes, labeled it exotic, and shamelessly attempted to capitalize on its popularity.

Two low-budget Dirty Dancing clones about Lambada were released on the same day, March 16th, 1990, to audiences as scant as the clothes worn by the actors. The two films, Lambada and The Forbidden Dance, only brought in $6 million dollars between them – but what more could one expect from the same studios that brought us the horrific Masters of the Universe and the criminal Superman IV: The Quest for Peace.

The title of this unpitched percussion piece (if it wasn't already clear) is a blend of the word "Lambada" and the word "Lobotomy". I debated writing out a history of the barbaric practice of lobotomy, but I don't want to bum anybody out.

Although I wasn't intending this piece to be programmatic, it actually kind of formed a program when I came up with the title after I finished composing. That's what Bob Ross would have called a happy accident. I like to imagine that the music is sort of a lobotomized version of Lambada – say that five times fast. The cymbal effects at the beginning are the sounds of the lobotomy surgery taking place. Then, when the hand percussion enters, it's kind of groovy and almost danceable, but there's just something that's a little bit off about it. I hope you enjoy it.

And by the way, there's an article on theweek.com by Eric Snider that chronicles the production of the two Lambada movies, and it's actually pretty hilarious – you should totally check it out … oh, but please, not during the performance.

Noninvasive Blood Alcohol Measurement System Senior Project

Joshua Arucan, Davin Kaing, Cameron Shields, Muhammad Waqas

Faculty Mentors: Huihui Xu

The Noninvasive Blood Alcohol Measurement System is a bioengineering senior project that obtains a Blood Alcohol Concentration (BAC) value from a driver in a noninvasively then, if above a certain limit, prevents ignition in a vehicle. In this system, the aim is to have a quick and simple way to do this while impeding a sober driver's ability to drive as little as possible. The system is made up of two major components: the sensor sending data and the microcontroller receiving and analyzing data. Two types of sensing methods were explored in the project: an infrared radiation method and a breath alcohol sensor method. The sensors were prototyped and tested using a known amount of alcohol while using a breathalyzer as an accuracy check to determine the feasibility of the sensors made. Each sensor used amplified voltage changes from a baseline to determine a change from a sober control state, which depending on the amount of voltage difference, would determine the BAC of a person driving. This difference, even with amplification, was found to be too insignificant for the IR to distinguish from noise, but enough difference for the alcohol sensor. This alcohol sensor will be implanted into a steering wheel to replicate driving conditions and tested further to calibrate the sensor for future use.

3D Printed Prosthetic Arm with EMG Controls

Amy Bolme, Brandon Bell, Matt Mannshardt,

Faculty Mentors: Huihui Xu

Prosthetic technology has been advancing in the scientific community to the point where amputees are able to control the prosthetic in various ways. For example, one such method is to voltage signals from muscle contractions to trigger motors in the prosthetic to move the fingers of the hand. This project explores the practicality of this technique by building a 3D printed prosthetic arm installed with five individual servo motors. These motors are housed within the forearm, and are connected to an arduino, a microcontroller, that receives information from EMGs, or electromyography that are placed on various muscles on the subject's body. As the subject flexes specific muscles, The EMG will record the electrical potential that the muscle is putting out. This signal then travels to the arduino which will then determine if the signal is of the correct value for a predetermined action. If it is then a signal is sent to the motors which in turn causes the hand to move, to grab, or pinch through predetermined actions which allow the patient to interact with various objects in their environment.

Portable Shoulder Rehabilitation Device

Brad Hirayama, Tyler Fraser, Thi-Vu Huynh, Greg Trenk

Faculty Mentor: Huihui Xu

Shoulder injuries are the most common injuries for overhead throwing sports. In sports where the shoulder is used in a repetitive motion, such as baseball, waterpolo, etc. there is a greater than 50% chance of a shoulder injury occurring during an athlete's playing career. Prevention and rehabilitation techniques for these types of injuries have been a hot topic for athletes from the professional to little league level. The problem that athletes are facing with the current devices are their portability, functionality, and ergonomics. To remedy these problems a self-propelled, ball shaped device was created for rehabilitation and general strengthening use. The intensity of the vibration of the ball dictates the amount of resistance the user must provide; thus, allowing for users from post surgery to healthy to use this device effectively. Utilizing electromyography (EMG) testing on specific parts of the shoulder this device shows comparable muscular activation to current devices on the market. This device will change the way that shoulder rehabilitation, strengthening, and conditioning will be done. Athletes will be able to easily transport this device and use them without the assistance of a

trainer or teammate, making this device a more portable, functional, and ergonomic version of any device on the current market.

Wearable American Sign Language Translation Device

Kylee Schesser, Chase Crimmins, Jujhar Bedi

Faculty Mentors: HuiHui Xu

There are up to 2 million American Sign Language (ASL) speakers in the United States alone, and ASL is the primary sign language of deaf communities in these regions. However, unless an individual is part of this community, they typically do not know ASL therefore limiting communication between ASL and non ASL speakers. We are attempting to create a wearable glove that will translate the sign language of the word pacific into English. In order to do this, five 3" flex sensors, each for the five fingers, will be attached to the outside of a glove. The sensors will then be connected using a voltage divider in order to measure the change in voltage across each sensor. An Arduino Uno Rev3 microcontroller will be used to assign alphabetical letters of the word pacific to the changes in voltage. We will take 20 random trials of the device in order to test the accuracy of the device. Our goal is to translate the ASL equivalent of the word pacific into English with at least 75% accuracy.

San Joaquin County Regional Sports Complex: Soccer Field Redesign

Jordyn Doyle, Susana Valencia, Robert Carter, Christopher Welch

Faculty Mentor: Luke Lee

The San Joaquin County Regional Sports Complex is a 70 acre complex located in Stockton, California that offers four baseball fields and four soccer fields. This complex hosts numerous soccer games as part of the Stockton Youth Soccer Association (SYSA) and by other baseball leagues. Although this sporting complex possesses a lot of potential to host both soccer and baseball tournaments, games, and practice, the lack of proper maintenance and the unleveled fields have caused the fields to have cracks, holes and ultimately create unplayable conditions. The fields are also unlit, leaving nighttime playing impossible. More fields will also be needed to accommodate further use. This project proposal will cover the renovation of the Regional Sports complex. We will be proposing the regrading of the soccer fields with an installment of turf, along with a new storm water collection system and clubhouse. We intend to redesign the fields so that space is maximized. Our team will also work on a new design of the parking lot. This will all be in an effort to rejuvenate and modify the fields in order to make the fields have the most optimal playing conditions.

Calaveras Housing and Land Redevelopment Project

Thomas Livensparger, Jeremy Sopoaga, Ryan Gleave, Pha Tran

Faculty Mentor: Luke Lee

University of the Pacific has expanded since its inception in 1851, and continues to grow with more students enrolling and new programs being established each year. The growth of the school demands that campus grounds be improved upon and new facilities be constructed in order to cope with the ever increasing needs of the university. This proposal details the plans for the redevelopment of a site on campus and design of new apartment complexes. Also, new multipurpose fields will be designated on the project site plan. A larger consolidated parking lot, and access road to Brookside Road will be designed as well. Site drainage will be designed to mitigate the impacts of development. Completion of this project will centralize these facilities, making them more easily accessible to the university. The apartment complexes will be designed to fit in with campus aesthetics. They will be located closer to the DeRosa University Center (UC) as well as other classrooms and lecture halls, meaning that the students living in these apartments will have a shorter distance to travel when heading to class or to the UC for a meal. The apartment complexes will be steel structures, designed in accordance with American Institute of Steel Construction (AISC) Steel Construction Manual. Site drainage will be designed following the standards and restrictions set by the Stockton Stormwater Quality Control and Criteria Plan (SWQCCP). New roads and parking lots will be designed following the standards set by American Association of State Highway and Transportation Officials (AASHTO), and a seismic analysis of the structures will be performed in accordance with ASCE 7 and International Building Code (IBC). Design shall comply with the Americans with Disabilities Act (ADA) as well.

NSJWCD Pump Station and Irrigation Distribution System

Hayley Palilla, Ryan Teixeira, Sierra Brandt, Chad Kumabe

Faculty Mentor: Luke Lee

Due to the current drought experienced throughout California, there has been an increased need for a reliable water supply. Many agriculturalists have depended on pumping groundwater from their wells in order to obtain water for growing crops. However, a growing concern involving the depletion of groundwater in recent years has prompted a need for alternative solutions. Established in 1948, the North San Joaquin Water Conservation District (NSJWCD) provides a reliable water supply to the 150,000 acres of agricultural land near the

City of Lodi . It is the mission of NSJWCD to supply these agricultural fields with access to surface water instead of pumping valuable groundwater from the Northern San Joaquin Groundwater Basin. In order to accomplish their mission and continue to service an expanding demand for water from their agricultural customers, NSJWCD has proposed new pipelines as well as updates to some of their existing pump stations and pipeline. In addition, the NSJWCD has proposed that an existing pump station and irrigation pipeline be demolished and redesigned in order to meet the design specifications and the future needs of the community. Alpha Zulu will design the pump station, irrigation pipeline, foundation and wet well. The client will be provided with a final report summarizing the design. Detailed drawings of the pipe network layout, wet well, connections and pump will also be included. The pipe network layout, pump station, connections and foundation will be drawn using AutoCAD drafting software. The structural analysis of the wet well will be performed using RISA 3D. Additionally, Alpha Zulu will provide the client with a California Environmental Quality Act (CEQA) Report as well as a summary of our design material quantities and cost report.

Robb Garden Renovation & Development Project

Ellen Tiedemann, Georgia te Velde, Giles Domkam, Abdulla Alolayan

Faculty Mentors: Dr. Luke Lee, Dr. Gary Litton, Dr. Camilla Saviz, Dr. Hector Estrada

Gage Engineering under the leadership of project manager Ellen Tiedemann aims to redesign UOP's Robb Garden to increase its sustainability and access. The current drought in California has created many restrictions for water use. This has rendered Robb Garden insufficient towards it original purpose of being an example of sustainability. Gage Engineering plans to add a stormwater collection system and filter to combine with the current irrigation system. UOP's south campus has a long history of traffic safety issues, as well as mobility issues for the disabled. This factor has greatly impacted the

success of Rob Garden and it's surrounding institutions The road entrance and South Campus parking will be redesigned to fix these accessibility issues. Not only will this make the area much safer, but it will increase the noticeability of Robb Garden and community attractiveness. Robb Garden was originally designed to serve as a learning and agricultural resource center for students and community members at UOP, however, it has not been able to reach this potential due to the previously stated problems. Gage Engineering will supplement the renovation by adding a reinforced concrete structure where students can learn study research and propel Robb Garden to its full capacity.

Computer Science Senior Projects

Regent

Tyler Anderson, Chris Bolt

Faculty Mentor: Michael Doherty

Abstract: Regent is a game that will be part of the first person zombie shooter genre. There are very few zombie shooters set in the 1400s or earlier, most are set in World War II or later. This empty spot in the market is a great opportunity to create a project that would be appreciated by a segment of the gaming community.   The game was created using the Unity game engine. Some of the art assets for the game, which help to create the environment of the 1400s, were acquired from the Unity Asset Store. The rest of the art assets were created as part of this project. The game currently has four levels for the player to explore and conquer. Each level is based in the same village of Ragnarök, which has been overrun by zombies. The game contains two weapons and zombies that summon on each level. There is a goal for each level that you need to complete before you move onto the next section, for example get the key to unlock the door to the next level. A primary design objective is that it is meant to be difficult. The game should evoke feelings of fear and stress in the player. That way when the player completes a section there is a feeling of satisfaction.

AndroSax

Marcus Barnes

Faculty Mentor: Michael Doherty

AndroSax is an Android Application designed to simulate an E-Flat Alto Saxophone. By making use of Android's sensors, gestures, & multi-touch capabilities, supporting up to 10 simultaneous touch events at any given time, the structure of a saxophone can nearly be captured in its entirety. Containing all primary keys, a few notable secondary keys, and the octave key, this application can cover a wide range of scales both major and minor.   The main goal is to have a more convenient way of playing the saxophone wherever one may be. This application aims to provide a genuine experience of what it is like to play the saxophone, targeting anyone who has an appreciation for music in general. While many people do not own an instrument, nearly 2 billion individuals have smartphones - more than half being Android. Though this is directed towards the saxophone, the concept can be applied to other instruments, taking us towards the goal of making it possible for everyone to conveniently play an instrument.

AppFinder

Bren Belen, Brendan Soper

Faculty Mentor: Michael Doherty

As of February 2016, the Google Play Store has more than two million apps available. Despite this, the only method for searching is by category of applications. There is no way to search for apps by criteria such as "most downloaded" or "highest rated", nor is it possible to search for apps alphabetically or by their size. It is also nearly impossible to filter results. For example, one cannot remove apps with in-app purchases or only show apps that meet a certain content rating. Having such search features would be useful for anyone who is looking for an app, but is only interested in apps that meet certain requirements. AppFinder is an Android application that allows a user to look for a certain type of app on the Google Play Store, then sort and filter the results by criteria chosen by the user. Specifically, a user can sort app results by number of downloads, number of ratings, average rating, application size, or alphabetically. The filter option removes apps with certain criteria from the results. A user can request to see only apps with or without in-app purchases, apps that meet a certain content rating (for example, a teen rating), or apps belonging to a certain category of games (such as racing, cooking, or card game).   The user interface for AppFinder was designed to be simple and intuitive to users who have experience with similar searching tools. A user query consists of a topic of interest, and selection and sorting criteria. The selection and sorting criteria are chosen from familiar drop-down lists. The result will display information about each application

that matches the user's criteria, along with a link that redirects to its Google Play Store page.

Loop - A Way to Stay in the Know

Micah Byerly, Andrew Mora, Trevor Martin

Faculty Mentor: Michael Doherty

Loop is a free, easy to use web-based chat and social media platform. Users can sign up, create a list of their favorite subjects, and immediately start enjoying conversations with others who have chosen the same topics. Topics of conversation can be anything, from the most broad fields like sports and music, to specific people and events like Albert Einstein or the moon landing. Through their conversations, users can bring about new innovative ideas, or simply discuss their fond memories. It is hoped that this platform will allow people to connect faster and share their experiences and ideas in an entirely new way. Loop can be thought of as a combination of many existing popular social media sites, merged into one. Users can have a profile that they customize which will show off their topics and ideas, and also chat about anything they'd like with other users. Once they feel they have talked enough about a category, they can freely add other topics to their profile to advertise their interests, then join with others and learn much more about them.

Commuter Alarm Clock

Stephen Carpenter, Glenn Contreras, Deana Ceja, Scott Jones

Faculty Mentors: Michael Doherty, Emma Hayes

The Commuter Alarm Clock is an Android app intended to make travel planning easier for those who have to commute to their destinations. One of the most difficult parts of long commutes is deciding when to begin traveling, and this app is meant to solve that problem. It works like most alarm apps: a main screen lists all alarms that the user has set, and an edit screen allows the user to set new alarms or edit existing ones. However, unlike other alarm apps, the Commuter Alarm

Clock also allows the user to enter their starting location, their destination, their mode of travel, and the amount of time it takes them to get ready. The app uses this information, along with continual traffic updates from Google Maps, to determine when the alarm should go off and the user should begin getting ready to leave. This app will eliminate the stress of worrying about how traffic will affect travel time.

SafeChat

Steven Feltner, Cameron Cowan, Neha Tammana

Faculty Mentor: Michael Doherty

SafeChat is an android application that allows users to safely and securely chat with another user. The problem SafeChat will solve is creating a secure messaging app between friends, colleagues, and associates. The current solution is to use special browsers and discrete messaging systems on a computer, but these do not allow for real-time messaging mobily. SafeChat solves this by being a downloadable mobile application that allows for secure messaging with people you know. Security is achieved by using a standard encryption algorithm on the mobile device side of the application, not the server side. This allows for safer transmissions as any data that could be intercepted by a malevolent party could not be read or understood. The application functions by having a central server to process users chats from their android devices. Users are required to create an account with a username and password. Once successfully logged into their unique secure account, users have the ability to add other friends and securely chat.

Project GIRO

Cameron Franke

Faculty Mentor: Micheal Doherty

Project GIRO (Genetic Investment Recommendation) is an algorithmic trading system. The goal of Project GIRO is to streamline the process of stock market investment. Project GIRO uses a machine

learning technique called a genetic algorithm to generate trading strategies. Those strategies are then used to provide the user with a short list of viable investment opportunities. This program can save investors time by performing time consuming tasks like mathematical analysis and strategy back-testing. Project GIRO is capable of inventing investment models that employ a variety of different strategies based on the goals and starting capital of the user.

Pacific Fantasy Sports

John Kaehler

Faculty Mentor: Michael Doherty

Pacific Fantasy Sports was created to bring together Pacific athletes and the student population at large. The application, available on Android, allows individuals to select a sport, create a team, "draft" Pacific players, and have them compete against each other based on their cumulative statistics. This project was created with a strong emphasis on a well-designed user interface. Simplicity and consistency are two themes that the developers strove to follow. Ideally, with a strong user base, Pacific Fantasy Sports will enhance the relationship between student-athletes and the rest of the community, and will result in greater participation and enthusiasm in athletic events.

MYO Camera

Edward Kim

Faculty Mentor: Michael Doherty

Recently, the smartphone camera has replaced the digital camera, and the selfie stick was invented to provide a convenient method to take photos of yourself. However, most of the selfie sticks don't come with controllers, or the controller is limited to shutter control. MYO Camera's aim is to break the limitations of the current wireless camera controllers and provide additional features in manner that is easy and natural to use.

MYO Camera is an android camera application that controls various camera features like zoom, flash, and autofocus using Myo Armband. The app interfaces with the Myo Armband, which is is a wearable Bluetooth device that senses arm muscles and sends data to the connected device. After connecting the Myo Armband to the app, simply spread your fingers to take photos, wave your hand inward to turn flash on and wave outward to turn flash off. The autofocus feature will activate if a user double taps their thumb and middle finger. MYO Camera will be free to purchase once it is published to Google Play Store and Myo App Store.

Ocu-Cross

Andrew Lemley, David Ngo, Daniel Urabe

Faculty Mentor: Michael Doherty

In today's society, technology is a central component of daily life for people of all ages. Children are especially able to utilize technology to learn and grow while engaging in fun activities. In such a busy world, traffic safety is an extremely important lesson for children to learn, as there are thousands of pedestrian traffic fatalities in the U.S. each year. Our Unity3D application, Ocu-Cross, uses the Oculus Rift virtual reality headset to simulate a variety of common traffic scenarios in order to give children a fun, interactive way to learn the importance of vigilance and preparedness when dealing with crosswalks, stop signs, stop lights, and sidewalks. Our application teaches children how to properly wait for a vehicle to come to a complete stop before crossing, how to look both ways for oncoming traffic, and how to use a stop light crossing. Ocu-Cross also provides many useful tips for scenarios that are less common, such as dismounting your bicycle before crossing a roadway and putting away your cell phone, game device, or music player while using a crosswalk. Our goal is to provide a more fun and effective way to learn the same lessons taught by the traditional traffic safety videos often shown in schools. Our hope is that our application can serve as a prototype for similar training environments to be used in classrooms across the country.

GlassFinder

Michael Morelli

Faculty Mentor: Michael Doherty

We all have a lot to keep track of: passwords, keys, email addresses, phone numbers, due dates, mobile devices, friends, family and more. Google Glass can support a solution to locating a mobile device, which in turn may help you locate a particular individual (assuming that they carry the mobile device near to them). The Android Software Development Kit (Android SDK) gives access to many different sensors, the key one here being the GPS sensors which can provide a latitude and longitude for a particular device. Google Glass operates on the Android SDK, but provides a much more simpler interface allowing the user quicker access to specified information. Leveraging the Android SDK and Google Glass I have developed the GlassFinder app which allows a user to insert a device ID with which they can get the general direction of the device (via a dynamic visual indicator on the Glass' display) and an approximated distance (via text on the display).

The Artist "Obsolution" Project

Bri Prebilic Cole, Kyle Shepodd

Faculty Mentor: Michael Doherty

Computers have traditionally been used as cognitive logical engines for solving difficult problems, but conventional wisdom says they lack the ability to be creative. This application is designed to prove that a computer can tackle creative problems by having an application generate digital art via artificial intelligence. In order to tackle this digital art generation problem, the application should be able to generate its own art based on guidelines. The application takes search terms from the user for what the final piece will look like, and uses these to find a goal image on the internet for what the final artwork will look like. The final artwork is a collage of smaller composing images, also found online by specified user search terms. The program utilizes a genetic algorithm to create a new collage of smaller images that will ultimately look like the goal image. Canvases are randomly generated in the beginning of the application and those that match the goal image closest on each iteration of the genetic algorithm are used to create new canvases. This process is repeated continuously until the canvases that the algorithm creates are similar enough to the goal image. This method allows our application to act in a manner that appears to be incredibly creative, breaking through the presumed barrier of creativity in computer science.

Code Workstation

Lukas Rickard, Jake MacMillan

Faculty Mentor: Michael Doherty

Code Workstation is a lightweight and intuitive tool for building and testing small programming projects, designed to be useful to both professional and hobby programmers. The majority of software developers rely on an integrated development environment (IDE) to automate and organize their development experience. Popular IDEs such as Eclipse, Visual Studio, and Code Blocks can be cumbersome due to their steep learning curves. This tool will fill a niche between command line testing and full IDE programming. The primary features will allow users to create buttons and scrolling text boxes. The buttons run user created commands and output to a selected text box. The text boxes can also be set to run commands automatically, providing users with constant updates on the status of their project. Code Workstation will provide programmers with a unique and lightweight way of testing and developing their scripts and small projects.

LTE Tester

Gary Roberts

Faculty Mentor: Michael Doherty

LTE is an international standard for wireless communications which is widely adopted among the major telecommunications providers. LTE offers very high data rates and low latency over long distances, but it requires extensive

engineering and maintenance to design and maintain. There are currently several enterprise-grade tools that can be used to troubleshoot and diagnose LTE networks but they are hardware-specific with very high licensing fees. The goal of this project is to produce a hardware agnostic LTE tester that could be used as an alternative to the industry standards. LTE tester will run on the Android platform and use the native radio interface library to offer a truly hardware agnostic experience. The tester will offer both a real-time metric report as well as a configurable drive test. The drive test will record the current received signal with its respective GPS coordinates for the given duration.

Integrating Google Analytics into Storage Snapshot

Jack Shih

Faculty Mentor: Michael Doherty

This project integrates Google Analytics into Storage Snapshot, a tool developed by Intel allowing users to determine bottlenecks in their system. Storage Snapshot runs on enterprise systems concurrently with a workload to look at system performance as a whole. Aspects the tool looks at include: CPU usage, memory usage, network usage, and mainly storage utilization. Users using the tool are able to determine how hardware upgrades can increase performance. The main benefit of Storage Snapshot is to allow users to scale up instead of scaling out. This maximizes a user's return on investment. The main benefit of integrating Google Analytics is to allow Intel to view how end customers are using the tool. With this information, we can learn how to improve the tool as well as target specific customers with the correct solutions. For example, if we can see users consistently skipping over an area of important information, we can move that information to a more visible location. Without Google Analytics, the tool would just be a tool. Now it is a customer solution and a way for Intel to enhance future innovative products.

Creation Clothing Application

Jared Weiler

Faculty Mentor: Michael Doherty

Creation Clothing Company is a small, local clothing brand with the goal of expanding. One of the biggest challenges with growing a small clothing company is keeping your fan base interested and connected with the brand, as well as offering an easy way for potential buyers to do the same. Creation Clothing Company feels that the next step for their brand to take is development of an Android mobile app. This app will display the brand's news articles and blog posts as well as information on the different products that the brand sells. To keep track of this data, development of a database that is interacting with the app will be necessary. Further features include a section that will display the Twitter feed of the brand's Twitter account and the ability to purchase products from the app itself.

A La Minute

Lavern Zhang, Alexander Flores

Faculty Mentors: Michael Doherty

A La Minute is a web application that allows users to enter ingredients from their kitchen to generate possible dishes they can cook based on those ingredients. Users have the option to modify their virtual kitchen by adding or removing ingredients. Once ingredients have been entered, the application will use an ingredient-matching algorithm to dynamically generate a list of meals that can be made using those ingredients. Users also have the option to view an additional list of meals that can be made if they had a few extra ingredients. Along with the meal suggestions page, users have the option to view the recipe of a matched meal via a Google search. The simple design of A La Minute allows users to easily solve their cooking problems "in a minute"!

Quad Control-Voltage/Pulse Delay Generator Buchla 200 Synthesizer Module

David De La Vega, Taylor Morlan, Mike Carroll

Faculty Mentor: Ken Hughes

The Buchla 200 series synthesizer is a modular, analog-based musical instrument. To expand the functionality of the system and introduce a new type of method for user interaction, we have designed a module that utilizes a touchscreen-based computer to send control signals to other modules. This module has two specific functions. Pulse Delay Function: This module will output several delayed voltage pulses for triggering other modules. One external voltage input pulse (or an input pulse generated by the module itself) will be used to initiate several delayed output pulses. The output pulses are cascaded, as each pulse will only occur if the previous pulse has outputted. The delay duration can be modified by the use of control voltage inputs, direct user input, or both. CV Generator Function: This part of the module will create control voltages that can be used to effect change at other modules. This will feature a touchscreen display where the wave shape of each control voltage can be defined by the user through input on the display and modified as needed. The display will show the control voltage values over time. This time axis can be modified by the use of input control voltages, direct user input, or both. Each control voltage output can be started or stopped by the user if desired. In addition, the user can loop the output control voltage or play it once. The Pulse Delay Function can be used, if desired, to start the CV Generator Function.

LASER Warfare

Jason Forslin, Thomas Snider, Thomas Vogel, Logan Chavez

Faculty Mentors: Jennifer Ross, Rahim Khoie, Ken Hughes

This project, Laser Warfare (based on the project Drone Wars), is a game system in which each player will use a drone or quadcopter to shoot other players' drones. The game is based on the original laser tag and uses many similar concepts and devices. Laser Warfare will operate on a communication network based around radio frequency Xbee transceivers. The

purpose of this project is to pursue a topic of interest to group members that will require the use of knowledge gained from this educational institution to design, solve, and build a large scale project. The resultant design of Laser Warfare was tested and a proof-of-concept prototype constructed. The testing that was performed shows that the design will work, and follows from the final prototype of the project. Furthermore, this project includes summaries of all related research, testing, commitment to the project, and all potential design alternatives explored.

Brain Controlled Robot

Christopher Geeter, Antonio Calderon, Seung Ki Song, Viseith Le

Faculty Mentors: Elizabeth Basha, Ken Hughes

This project will explore the feasibility of using a brain-computer interface (BCI) to control a robot for home care applications. The current options for the brain-computer interface will be considered for cost-benefit analysis, and the robot will be designed and built by the project team. The project will put focus on the design, fabrication and testing of the robot and BCI system. The robot will be instructed via the BCI to carry out a specific task, such as move in a specific direction, at which point it will use its own intelligence to execute the command.

Exhale or Jail

Greg Lehr, Alec Tong

Faculty Mentors: Jennifer Ross, Ken Hughes

This project designs an accurate breathalyzer compatible with Android smartphones. The device is able to measure the user's blood alcohol content, or BAC, by blowing a constant amount of breath. The user's BAC is displayed on the supplied smartphone along with warnings for the legal limits in the user's state. Breathalyzer must be calibrated to zero by the phone app. User can input the state or the phone can use GPS to identify local laws for driving under the influence. The phone app gives instructions regarding how to get an accurate reading as well as displays a BAC level with +/- 30% accuracy. The breathalyzer connects to an Android smartphone via bluetooth and is powered by a LiPo rechargeable battery. The

device is compact enough to wield with the phone and store in a pocket.

Audio Phaser and Equalizer

Connor Morales, Hassan Jahami

Faculty Mentors: Ken Hughes, Rahim Khoie

The purpose of this project is to create an analog-based audio effect system that is reminiscent of older systems used before digital effects became popular. Two different audio effects were implemented in this project: a Phaser and an Equalizer. A Phaser was originally used as a guitar effect, and remains one of the most popular after being heavily utilized by Jimi Hendrix. Equalizers allow the volume of individual pitch ranges to be changed independent of each other, and are used in all types of audio systems from home theaters to studio production. All filters required by these audio effects were designed from the ground up mathematically with MATLAB, then simulated electrically with spice software. The final product is a series of custom-made Printed Circuit Boards (PCBs).

Elecronic Piano Team

Kyle Ugale

Faculty Mentor: Ken Hughes

Our task is to design a system that is capable of detecting piano notes an octave above and below the Middle C key. This means the system used will need to be able to identify frequencies ranging from around 100 Hz to about 600 Hz. The system must also be able to identify chords I, IV, and 5-7 in the keys of C,F, and G. This system has to notice when multiple notes are pressed and identify the chords based on the frequencies identified. The system will also operate in 2 modes, one where the system will listen to and display the notes played by the user, and a second mode where the system will prompt the user for a note which will be displayed on screen, and after the user plays a note, the system will provide feedback on whether or not they played the correct note by displaying on the screen and having an audio tone playback. The targeted audience for this project is meant to be 6-12 year old children.

Automated Camera Track

Emanuel Abarca, Fahad Almenai, Abdul Alshaiji, Felix Maravillas

Faculty Mentor: Kyle Watson

Photography and videography are rapidly growing hobbies due to the increase in smartphones with cameras and its significance in creating long-lasting memories. Because of the growing market, this camera track has been designed to help users take their video experience to the next level. Unlike other camera tracks, this project aims for smartphones, pocket cameras, and some lightweight DSLRs, with a cheaper price than products currently available on the market. The entire project was made from simple parts that were either machined easily or available as standard low price parts. The project successfully met the objectives of being under $300, having a reasonable length of under three feet for portability, and having a small controlled motor connected to a precise lead screw that provides the ability to create professional looking videos.

Precision Analog Shower Knob

Benjamin Aguilar, Oscar Gerstenberger, Vincent Lavaroni, Armand Matossian

Faculty Mentor: Kyle Watson

Finding the ideal shower temperature is a task encountered every day; a small movement of the shower knob can result in a radical temperature jump in the water exiting the shower head. This project's mission is to design and fabricate a shower control handle that will enable the user to quickly and accurately obtain their desired water temperature. This process is achieved through a gear reduction system employing dials to perform coarse and fine adjustment. Currently all final design objectives have been achieved. Minor 3D printing amendments are being made to further overcome manufacturing obstacles, and once those changes have been applied, it is anticipated that product testing will prove a successful design.

Miniature Wind Turbine

James Benefield, Joshua Dorris, Michael Fischer, Zoie Oberg

Faculty Mentor: Kyle Watson

The purpose of our project was to design and fabricate a miniature, horizontal axis, single pitch wind turbine that takes measurements of power, thrust, and RPM for use in the University of the Pacific wind tunnel. This project will be used as a teaching aid by the university and as such needed to be easy and safe to use. Safety was maintained by having significant factor of safety for the device and by adding a means of limiting the max speed of the wind tunnel. The turbine was designed to attach to a mounting used for other projects, so installing or removing it would require little effort. The mounting also allows the turbine to be fixed facing different angles, so the effects of wind direction can be measured. The wind turbine has interchangeable hubs which have differing numbers of blades. A generator is used to output power and a strobe tachometer is used to measure revolutions per minute of the device. The generator and a strain gauge are connected to a circuit board which reads out the values for power and thrust while recording them to a computer.

Adjustable Load-Bearing Leg Brace

Hannah Bettencourt, Molly Bettencourt, Joshua Tunquist, Jeremy Wood

Faculty Mentor: Kyle Watson

A fully adjustable load bearing leg brace was designed and fabricated to target lower ankle and foot injuries. There is a need for a more comfortable alternative to crutches that improves recovery time for forefoot and midfoot injuries and foot surgeries. By allowing for controlled movement in the ankle during the healing process, the risk of atrophy will be reduced. As the injury heals, the load distributed to the foot can be adjusted through the use of air cylinders. Initially, while walking, the user will feel no load in the lower leg because the full amount of impact force will be absorbed by the shocks. The pressure in the shock absorbers will be decreased as the healing process occurs, thus increasing the load felt by the lower leg. The flexion in the ankle can be increased in increments using a dial system with

varying slot sizes. A proof of concept was constructed that contains both modes of adjustability.

Coupled Jet Engine Proof of Concept

Andrew Bose, Anthony Leonetti, Kevin Leong, Joshua Saltsman

Faculty Mentor: Kyle Watson

This project demonstrates the possibility of a new type of internal combustion engine, using jet engine technology to create shaft-work. This configuration could be adapted to run on any number of fuels and produce enough power to be used instead of the traditional four-stroke engine. This design offers fewer moving parts, size, and eliminates the rotary action of a piston and cylinder. To prove the possibility of this design, four configurations are modeled in 3D CAD and tested through CFD simulations. Each configuration is simplified, omitting components that would be similar to a traditional jet engine. For simulations, the compression and combustion phases are included through input boundary conditions. Of the four configurations, the most successful was constructed out of plastic. The demonstration model is powered by compressed air and includes instrumentation to relate actual performance to CFD results. All results suggest that a functional Coupled Jet Engine could be built

Rotary 3D Printer/Additive Lathe

Jordan Briggs, Austin Jarvis, Stefan Soezeri, Jonathan Wagenet

Faculty Mentor: Kyle Watson

The purpose of this project is to design and fabricate a rotating cylinder 3D printer that allows manufacturing of complex cylindrical structures. Standard cartesian, extruded filament 3D printers have limited capability to produce strong parts due to z-axis layering and have trouble printing vertical lattice structures without plastic drooping. To address these limitations, a 3D printing lathe has been developed which prints on a removable rotating cylindrical surface. The project successfully met objectives to develop the mechanical motion system, extrude PLA plastic, and control the printer with G-Code instructions.

RC Car Optimized for Speed

Garret Close, Cameron Cornell, Katy Liege, Sean Ferguson

Faculty Mentor: Kyle Watson

The purpose of this project is to design and fabricate a remote controlled car that is optimized for speed, with the intent of breaking the world record. This project was chosen to encourage the idea of competition in the RC community using engineering design rather than kit parts alone. The motivation for this project was to push the limits in RC vehicle speed. A custom design for the chassis, gearbox, and all supporting pieces were designed based on results from FEA and dynamic analyses. Purchased components, such as shocks and motors, were chosen using decision matrices. The optimized car performed well as expected and with further testing and refinement could potentially reach the goal of breaking the world speed record.

A Tire Lift Assist System (ATLAS)

Ranjot Dhaliwal, Kristena Moules, Michael Nickel, Scharlyce Powell

Faculty Mentor: Kyle Watson

The purpose of this project is to design and manufacture a device to assist a user when changing a vehicle tire. The process to change a vehicle tire is often a physically demanding task that requires full physical mobility and may require assistance from a second person. This physical demand increases significantly for persons with physical disabilities or incapabilities. The device features a lightweight, mobile scissor lift device powered by a gas spring. The device possesses the ability to lift the tire to a sedan trunk for retrieval or storage. Additionally, the device allows the user to easily align the tire to the bolts for attachment, while eliminating the requirement of the user to hold the tire in place. Through an iterative design, prototyping, and testing process, a device was manufactured to fulfill the purpose of the project goal. The device was designed and fabricated for easy transportation and use as an alternative to roadside service. Due to the device being a new concept on the market, there is opportunity for future iterations and improvements.

Hybrid Tricycle

Trevor Doom, Grace Hamann, Daniel Lee, Alex Walker

Faculty Mentor: Kyle Watson

The purpose of this project is to design and fabricate a hybrid tricycle that is powered by both an electric motor and a gas engine for maximum fuel economy. The focus of this design is based on the need for a relatively inexpensive and efficient type of transportation that can also be used for recreational purposes. The vehicle has a user-friendly control system that is safe to operate and requires low maintenance. The vehicle achieves a top speed of 20 mph with a minimum range of 40 miles. In order to accommodate both power sources, a Schwinn 26-inch Adult Tricycle was selected as the vehicle chassis. The electric motor power source is a 800W 36V hub-centric motor that is fitted to a 26-inch wheel with a thumb control throttle. The gas engine power source is a 2-stroke 80cc engine. The tricycle's main drive shaft is modified to fit the chain-driven system of the 80cc engine. Finally, the vehicle is modified and tested to optimize ride-comfort and full functionality of the control systems while production costs were below $1,000.

Pneumatically Assisted Arm

Lee Graham, Matthew Mills, Chris Pallios, Grant Somerville

Faculty Mentor: Kyle Watson

Fields requiring industrial labor demand physical strength in the workforce despite the multitude of machines that can assist a worker with their everyday tasks (i.e. manufacturing, construction, maintenance, etc.). This project aims to assist and/or eliminate the need for physical strength that can sometimes push to the limit or exceed the capabilities of the average human body. For effective application, the project mainly focuses on pneumatic muscle concepts for providing an additional lifting and/or pulling force to the operator's aid, and electromyography (EMG) sensing to provide a biomechanical integrated control making use practical within industrial environments. Efforts also focus toward a system that is both compact and safe while accommodating natural arm movements. The design includes a 15 lb aluminum exoskeleton system that is capable of providing an assistive 30 lbs lifting and pulling force while operating via a 90 psi air supply line for lift and pull pneumatic muscle operation and a 12V, 5000mAh battery for powering the system and controls. EMG sensing and logic controls are supported by an Arduino UNO microcontroller. Equipped with pressure sensing and emergency kill switch functions, this machine is able to be safely operated and removed by its user.

Self-Spotting Bench Press Proof of Concept

Maxwell Hallmark, Tony Nguyen, Stephen Siu, Henry Velasquez

Faculty Mentor: Kyle Watson

With the growing trend of gym memberships and a population focused on being healthy, there is a need for a machine to eliminate the need for a human spotter to assist a person when they struggle performing bench press exercises. This self-spotting bench press was designed and fabricated as a proof of concept that would not hinder or alter a workout and would introduce to the public the necessity for safer exercise equipment. The self-spotting bench press provides enough force to lift a minimum of 30 lbs and is able to handle daily fatigue for a long lifespan. Moreover, it is user friendly, provides a safe environment for all users, and is responsive to the user's struggles during bench pressing via a foot pedal switch. Through the analysis of SolidWorks Simulations, dynamic calculations, and real world stress tests, the machine was determined to have met all set criteria while being within the budget funded by the School of Engineering and Computer Science.

Blood Money

**Sarah Kellner, Brandon Ramirez,
Kelly O'Moore**

Faculty Mentor: Patti McCarthy

When a 1920's gangster is confronted by his own greed, a surprising rise in power will occur. Blood Money, is a silent short film shot using Super 8 film. The noir style film aims to capture classic cinematography techniques such as light distribution and framing, as well as incorporate a modern aesthetic of editing. This film is inspired by Billy Wilder and his works in Hollywood cinema.

Single in Cyberspace

**Sarah Kellner, Brandon Ramirez,
Kelly O'Moore**

Faculty Mentor: Patti McCarthy

When a socially awkward woman is tasked with going on twelve blind dates from dating websites, her life gets turned upside down. But for the sake of keeping her job, she knuckles down on the task and has quite the adventure along the way. The romantic comedy Single in Cyberspace, aims to tickle your giggle buds and leave you with the warm and fuzzes. The dating world can be quite the freak show, and staying true to one's self can be harder than it looks. As a writer, I try to write to entertain myself first and foremost. If I don't get a kick out of reading something I wrote, who else will? Making this film really let the creative juices flow, and allowed me to pull from personal experiences that would otherwise be filed under the "Save Truth or Dare" File. Ultimately I wanted to capture this story, because we are now in a society that constantly offers us new ways to meet each other, while simultaneously making us embarrassing ourselves and acting a fool. But the beauty of it is, we are able to experience something real. Something to hold on to, and grow from.

Trapped Within

**Sarah Kellner, Brandon Ramirez, |
Kelly O'Moore**

Faculty Mentor: Patti McCarthy

Penny is suffering from Multiple Personality Disorder, and is confronted about her many "alters" that seem to be running her life. This performative short film, shares the journey of a young woman suffering with a rare disorder. The thrilling aspect is, who will she be next? Not even she knows. Creating this story, and bringing it to life has been an amazing experience. Writing, directing, and acting in this film has been a challenge, but also an amazing feat of growth for my creative outlet. I am inspired by great performers like Meryl Streep and Lucille Ball, and trying to capture just a piece of their brilliance in my own performance is the ultimate goal in this film for me.

Have a Nice Trip

Rachel Vanhorne, Carlos Castellanos

Faculty Mentor: Patti McCarthy

This film will be a psychological thriller that draws upon paranoia, supernatural elements, biblical references, and defense mechanisms that distorts the sensory perceptions of the way the mind sees. With the combination of drugs, guilt, and paranoia, the line between the real and the unreal is blurred. The film will explore the powerful phenomenon of being enticed by the unknown and the unexploited, and how the human condition is seduced by something unnatural and off-limits. The power of the subconscious mind relates to the deceiving enticement within mythological legends and biblical figures who indulge in activities they knew were glutinous, and that they're at the mercy of their actions for self-fulfillment. In accordance with the Christian perception of evil and manipulation, the Devil appears in several forms in this film. In addition, Alex resembles Adam, and Evelyn resembles Eve from the Bible. Just like Eve in the Bible, Evelyn is seen in a treacherous, manipulative light because of her lust for the mushrooms.

Evelyn experiences three psychological episodes shortly after murdering someone and having an out-of-body experience through drugs, and psychologically projects these feelings of paranoia and guilt upon others around her. The first stage of Evelyn's psychological episode is when 1) she thinks everyone is watching her and that they know about the murder. Then, this paranoid feeling escalates when 2) she believes that people are after her to murder her because she's paranoid that they know about the murder, even though nobody else was at the scene. She projected what she had done to others. In a last attempt of understanding her paranoia, 3) she realizes that nobody is targeting her, and feels like nobody can see her, like she is invisible. In the end, she realizes that she is dead, which is why nobody can see her.

Countdown

**Rachel Vanhorne, Ashley Yum,
Carlos Castellanos**

Faculty Mentor: Patti McCarthy

Countdown is a sketch comedy film that follows the humorous attempts of Stacy and Ben as they prepare for an unexpected Beyonce concert in a limited amount of time. Stacy and Ben run into a multitude of complications on their way. They need to first come up with the money for the ticket, and then struggle to create their best look for the concert, outfit and everything. The two friends argue about getting everything perfect, and stress about the details. The often self-deprecating, dry humor is echoed through the characters as they realize that they have to work together and think outside the box to get everything done in time. In the end, Stacy and Ben realize that the logistics of the concert don't matter as much as the other person who they're going with. Their friendship is restored, as the Queen Bey would want it

Saving Adelaide

Matthew Barnes

Faculty Mentor: Patti McCarthy

Saving Adelaide is a tragic love story. Adelaide and Malcolm are a newly-wed couple in their mid-twenties, just beginning their life together. They demark young love, and unforeseen circumstances get in the way. A false positive pregnancy test uncovers a terminal illness with Adelaide, leaving Malcolm to understand how to comfort and love Adelaide in multiple ways – how he tries to save her from the debilitating disease.

Animalia

Matthew Barnes

Faculty Mentor: Patti McCarthy

Animalia is an experimental work dealing with the effects of alcohol. It tells a rather loose story of three men running through an orchard, enjoying a bottle of alcohol. One of the three men decides he wants the bottle from himself and bolts in the opposite direction with the bottle. These men begin to fight over control of the bottle. This then pushes their characters from humans to animals, reflected in the masks that they don in the later sections of the film. Intermittently dispersed amongst the film are fast edits, inserting stock footage of animals fighting, close-ups of actors, and creating life that develops a larger scare with the need for alcohol – all placed to a nightmarish score and sound effects.With this film, I wished to explore the avenue of alcohol dependence; This dependence forces us to forget ourselves and eventually turn our cognitive thoughts back to base instincts. This is accomplished by creating a progression and suggestion throughout the film that leaves the audience with a cantilevered view and discontinuous flashes of animal anger. My overall goal is to create a piece of film that can probe the minds of audiences and spark meaningful conversations around the idea of alcohol dependence.

Acceptance

Jenna Phinney, Omar Sanchez, Linda Nuguyn, Daisy Lopez, Stephanie Lopez

Faculty Mentor: Patti McCarthy

Our film is about a teenage boy who struggles to receive the acceptance of his mother. His passion is art and his mother's passion is for her son to exceed academically. We follow along as the mother learns to accept her son the way he is. We chose acceptance as our one word because accepting other people as they are is the first step to healthy interpersonal relationships as well as

the building of a community and a good society. Feeling accepted allows people to speak up and let their voice be heard, and everyone's opinion is important in order for our communities to grow stronger.

Support

Estrella Heredia, Lisa Nguyen, Myhanh Nguyen, Mia Arostigui, Brianna Gonzalez

Faculty Mentor: Patti McCarthy

Our film is about giving and receiving support from people around your community and friends. Learning how to give support is one of the hardest things that people can possibly do, just because they may not feel supported or they don't know what support is, therefore they struggle with it. Support is an important aspect in peoples lives, we need it to grow, and to help other people grow in order for them to succeed in life. We'd like to think that we can do everything by ourself but really we need other peoples support in order to be successful with it.

Young and Dumb

Robert Shibur

Faculty Mentor: Patti McCarthy

This is the story of two high school boys that stumble upon a dark web website that would change the way that they look at the world. After making their first order and finding out that the website is legitimate they become hooked. One day, one of the young men decides to create a seller's account where he can sell his prescribed Adderall and perform a huge scam to help him pay for college. Little does he know this is the beginning of a very bad decision. The lesson behind this story is that when you make bad decisions, you never know who is watching you.

Maturity

Kyle Chen

Faculty Mentor: Patti McCarthy

Some kids mature faster than others, but when most of the kids grow up faster than others, it can be lonely for those who have yet to mature, and are left behind. In middle school, I knew a person who had, what I thought was a hilarious laugh, but some of my other friends didn't find it as funny, and found him annoying instead. Over time, though, he ended up changing, and ended up being less of a clown and more mature. At the time I had no idea what maturing really meant, so I thought up many wild theories of how he could have changed. I feel that the concept of maturity is foreign to younger kids, not because they don't know what it means, but rather because they don't grasp what it is because they haven't experienced it themselves. Nevertheless, maturing and growing up is very important, and part of being a person.

Freshman Fright Night

Eugene Kilbride, Jessie George, Ashley Yum

Faculty Mentor: Patti McCarthy

The film is a classic horror slasher film with a twist. I wanted to make something that was fun and enjoyable to watch but something that also had substance. I came up with the idea as an effort to address the complex social construction of the college campus. We are all familiar with the typical types of people that inhabit a college campus like the popular jock, or the popular sorority girl. But we often overlook the social outcast, the loner, or people who are just different. There is actually a much more diverse populace that make up a college than the typical archetypes. There will always be some degree of social injustice on college campuses but I hope after watching a film like this, people will think twice about being outright mean to one another. The purpose of the film is to shed the spot light on campus diversity while addressing the nation wide epidemic of bullying. I think we all have been guilty to a certain degree of making someone feel like an outsider or feel bad about themselves, even if we don't immediately realize what we have done (I am guilty of this all the time). I hope this film can make people think twice about their actions, and be mindful of others.

Impact

Louie Palacios, Muhammad Khan, Juan Giovany Zapata, Alondra Soto, Nia Hall

Faculty Mentor: Patti McCarthy

Every person has an impact on someone whether they know it or not. You could make an impact on someone's life forever with even the smallest gesture. Just asking how a person's day went might make a huge difference. Together we can make small changes in how we effect people and make a positive impact on society as a whole. More specifically, an educator can positively impact a student's educational life.

O, Love

Jessie George, Matthew Barnes, Eugene Kilbride

Faculty Mentor: Patti McCarthy

This is a film about the fickle nature of love, how quickly we can fall in love, and how poorly (or fantastically) this newfound love may end. This film takes us along the silent adventure of a young man pursuing his latest romantic obsession in hopes that he can sweep her off her feet. Centered on returning a pair of gloves; we, the creative artists, explore the difficulties of love and remind audience members that romantic gestures do not always go as planned.

The Haunting

Megan McVey

Faculty Mentor: Patti McCarthy

The Haunting is a thrilling short film about a young woman who stops taking her migraine medication one day and discovers that the pills may have been dulling something far more serious than headaches when she begins having visions of a little girl covered in blood. In the race to discover who the little girl is and why she is having these visions, she discovers secrets more gruesome than she expected. With the fear of her mental state intensifying, she doesn't know whom she can trust. Is she safe at home with her over-bearing mother? Or is she being haunted by another being entirely? The idea behind The Haunting is to leave audiences on the edge of their seats, unsure where the story might end up. As a psychological thriller/horror short, its main purpose is to make you question reality and realize that not everything is always as it seems. Sometimes you have to look in the mirror to see who the true monster is."

The Quiet World

Ashley Pham

Faculty Mentor: Patti McCarthy

How many times have you wished you did or didn't say something? A status on Twitter can be 140 characters, but what if our lives were really limited like that? Would we think more carefully about what we say or resort behind digital screens to do the 'talking' for us? In The Quiet World each individual is only allowed to speak 140 words per day in an effort to get people to choose their words more carefully and be more sincere. The short film follows Emily; though primarily silent throughout the film, at the end of the day, silence is all she can receive from her long-distance lover. This film is purposed to provoke individuals to think about the effect and effectiveness of their words, or omission of words entirely, beforehand.

Isolate

Hentry Greenthal, Jonathan Russo

Faculty Mentor: Patti McCarthy

Isolate is a short thriller. It focuses on a man who had isolated himself from the rest of the world in order to seek peace and efficiency. However, he is one night visited by a stranger on the other side of his door. The man explains the beauty of silence while also going through his own revelation about his position.

Murderer's Anonymous

Hentry Greenthal

Faculty Mentor: Patti McCarthy

Murderer's Anonymous is a satire horror comedy. It focuses on a group of killers who meet in an alcoholics anonymous like setting. However, when one of the members appears dead, the insecurities of the murderers take over. The colored film pokes at society's growing indifference toward violence in the media, to the point where it is treated just like a drinking problem, all the while topped with gore and laughs.

The Monkey's Fist

Scott Carter

Faculty Mentor: Patti McCarthy

This film is a modern take on W. W. Jacob's short story "The Monkey's Paw." Andi, a struggling single mother whose adult son is still living at home, acquires a cursed monkey's fist knot from her globe-trotting friend Maurice. It will grant three wishes each to three different people. She quickly learns that if you try to get the things you want the easy it will always come back to haunt you.

The Swap

Scott Carter

Faculty Mentor: Patti McCarthy

In a twenty-first-century twist on the old accidental switch trope, this film shows that you can learn a lot about someone when you have that person's phone and that sometimes even the smallest events can change your life for the better. Jae and Omi pass each other briefly and take each other's cell phones home by mistake. Over the next several hours they text each other a

form a bond they would otherwise have missed out on.

On the Edge

Brandon Ramirez, Sarah Kellner, Kelly O'Moore, Jessie George

Faculty Mentor: Patti McCarthy

A man finds himself at the bottom of his luck, and it only gets worse. Through heart break and stroke of luck, Jim takes his world into his own hands and contemplates the life he has created while running into a peculiar person. This film was created to capture the all too common struggles that we face in our daily lives, and how making one decision can effect the way in which we think. On the Edge is a short drama that deals with the concepts of defeatism, suicide, and enlightenment.

Love

Ceci Aguinaga, Edward Fierros, Miguel Bucio, Raul Mondragon

Faculty Mentor: Patti McCarthy

Our film presents the word love. Everything falls into place when a person is in love. People do good things through the power of love. People show respect and care for each other with love. We chose love as our word because a community is held together by the love they have for one another. We sometimes forget that showing others we care is very important because we can cause a chain of events without even knowing it. A simple good morning to a stranger could have the potential to set off a chain of kind events. That one simple gesture can make a person's day ten times better, and it may prompt the stranger to do the same and wish someone else a good morning or take the time to wait two more seconds to hold the door for someone else. Love is putting others needs before yours because of how much you care for that person. If everyone has someone to love, and someone who loves them, it will make their lives better. Love helps the world be a better place because there are people caring for each other. Society is better when there is love in it.

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