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HORIZONS

A quarterly newsletter for alumni, students, parents, faculty, staff, and friends
www.scu.edu/engineering/horizons

FALL 2005

From the Dean's Desk by Dean Daniel Pitt



Dean Pitt

A Barrage of Good News

The school year at Santa Clara sure started off with a bang last month. (We are on the quarter system so classes began September 19.) It's always nice to start the year off with some good news but getting an onslaught of it is quite a special experience.

First, US News and World Report published its 2006 edition of America's Best Colleges, ranking SCU's undergraduate engineering program number 14 in the nation. For years US News placed us in what we felt was the incorrect category, namely those schools whose focus is Ph.D. research, rather than those whose emphasis is undergraduate (and master's) education. Being an engineer, I decided to fix this problem because it did a disservice to students, the School, and the magazine. I found that it was simply a matter of convincing US News and World Report and the American Society for Engineering Education to adopt the Carnegie Classifications for undergraduate engineering programs; both organizations contributed very constructively to the solution and it was a pleasure to work with them. In a mere two years we accomplished this change, though we did not know where we would come out. We are of course thrilled to be ranked as one of the top undergraduate engineering programs in the country. We have always strived to be one and thought we were but it sure is nice to have that determination made by others. For those of you who are alumni, feel free to put this on your resume; the value of your diploma just went up.

Second, the School received a gift of \$1 million for undergraduate research in engineering from Jack and Carmen Kuehler. Jack received his B.S. and M.S. degrees in engineering from Santa Clara and is currently a member of the university's board of trustees. He and I both started our careers with IBM and were both hired into the company by the same person, Norm Vogel, SCU engineering class of 1948. Jack went on to become President of IBM; I did not reach quite that level. The gift was inspired by two assistant professors, Silvia Figueira and JoAnne Holliday, whom Jack and Carmen met at a donor's dinner. Drs. Figueira and Holliday have run a summer research program for undergraduates for several years now,



Jack Kuehler

and the students' experiences have dramatically stimulated their professional ambition so that a number of them have gone on to top-quality Ph.D. programs. Jack came away from the dinner so inspired that he wanted to help make the program permanent, which his gift does. Funds will be granted to faculty, who will employ students who can help them with their research. What is so exciting about research for undergraduates is that it enables them to participate in the creation of knowledge. Close relationships with faculty are, of course, one of our specialties here at Santa Clara.

Third, two of our faculty received prestigious awards at this year's Faculty Recognition Dinner. Professor Tim Healy (Electrical Engineering) was named Faculty Senate Professor for the year. Dr. Healy's many accomplishments over decades of service were cited in his winning this award. Next year he will deliver the after-dinner address at the Faculty Recognition Dinner. Professor Nam Ling (Computer Engineering) received a President's Special Recognition Award. Dr. Ling was cited for his passionate teaching of undergraduate and graduate students, his curricular innovations including a course in building global teams, and his many publications and invited talks around the world on the subject of video coding and compression, including contributions to the current standards for streaming video. The texts from both award announcements will appear soon on www.scu.edu/facultydevelopment/awards/index.cfm. Click on the award and then click on the name of the most recent winner to read the inspiring texts.

Lastly, we received the final findings from last fall's accreditation visit by the Accreditation Board for Engineering and Technology (ABET), a visit I wrote about last winter. Once again, our four undergraduate programs are accredited, as they have been since accreditation began. But the process was a very gratifying one and one that we received a lot of benefit from. By opening ourselves up to external scrutiny and entering the process with an eagerness to improve in any way we can, we enjoyed a highly constructive dialogue whose specific (though confidential) outcomes made the immense effort we put into the review worthwhile. Some of our new plans you will be hearing about in future newsletters.

Publisher's Notes by Dr. Cary Yang



Cary Y. Yang

On behalf of Horizons' editorial staff, I want to congratulate Dean Pitt on his successful effort in changing the category in which the School of Engineering is ranked in the U.S. News and Word Report annual survey. We also want to congratulate the entire School for being ranked 14th in the new category, as well as for receiving continued full accreditation from ABET for its four undergraduate programs. In addition, we urge you to read about other exciting new developments and recognitions mentioned in Dean Pitt's column and cited in other reports in this issue.

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Pilot Overseas Program For Engineers Begins in El Salvador

Six pioneering senior mechanical engineering students, Peter Adam, Anthony Fernandez, Daniel Jacinto, Michael Kledzik, John Rivera, and Matthew Wilcox volunteered and are spending five weeks in El Salvador as part of a pilot overseas program custom designed for engineers.

Using the newly acquired funding from the Technology Steering Committee, the School purchased the teleconferencing equipment customized for teaching distance learning courses that was previously on loan from Tandberg. The equipment will be used to teach four of the six classes live to the students.

Mechanical Engineering Professors Jorge Gonzalez-Cruz, Tim Hight, and Jeff Ota along with Religious Studies Professor Joe Morris will be offering their courses to the students live to the students while Professors Drazen Fabris (Mechanical Engineering) and Leonard Klosinski (Math) will be offering their classes through recorded content for one of the students.

During their five weeks there, three of the students will be working on their senior design project, deploying an autonomous underwater vehicle in the Lempa River for the hydroelectric power company, and the three others will be assessing communities and projects for future senior design teams. In a



Back Row: Daniel Jacinto, Peter Adam, Matthew Wilcox, Anthony Fernandez, Michael Kledzik, Father Mark Ravizza
Middle Row: The Paniagua family (Local Residents): Child, Karen Paniagua, and Mrs. Paniagua
Front Row: Professor Jeff Ota, Mr. Juan Pablo Paniagua, and John Rivera

partnership with Casa de la Solidaridad in El Salvador (www.scu.edu/casa) and with the extra work of Kevin and Trena Yonkers-Talz and Chris Wright, a Praxis (community-based learning) experience will also be included in their curriculum while the engineering students are in El Salvador.

The six were in El Salvador from September 14th through October 22nd. They rejoined their fellow students in the classroom at SCU on Monday, October 24th.

In addition to SCU students taking the classes online, five students from the Universidad Centro Americana Jose Simeon Canas (UCA) in San Salvador will be taking Professor Gonzalez-Cruz's Heat Transfer class, and two professors at the

UCA will be taking Professor Jeff Ota's Introduction to Mechatronics class to determine if they can offer it to their students in the future.

Making this project possible included the extra efforts from Todd Schmitzer and Eddie Butler from Information Technology at SCU; Enrique Fernandez and Rene Aguilera from Information Technology at the UCA; Professor Wilian Marroquin, Professor Ismael Sanchez and Professor Carlos Rivas from the UCA.

Outcome of Engineering Achievement Awards 2005

Each year the School of Engineering and the Engineering Alumni Board (EAB) recognizes distinguished alumni and outstanding faculty by presenting special awards. This year the event was held in the late afternoon of June 8. It was the first time that the School hosted this event in a public ceremony in the Mayer Theater, as well as the first time that a keynote speaker was featured. Dr. T.J. Rodgers, Founder, President, and CEO of Cypress Semiconductor Corporation, concluded the ceremony by giving a speech, "Silicon Valley Attacking New Problems: Renewable Energy." The advance publicity created for this speech definitely helped draw the attention of the Silicon Valley Community, but the overall success of the event was due mainly to the participation of the awardees and generosity of the sponsors.



Philip T. Go

Philip T. Go (MSEE '83, BSEE '81) and Gordon L. Stitt (BSEE/CS '80) were the recipients of the Distinguished Engineering Alumni Award, the highest honor bestowed by the School to

an alumnus, for their contributions to society, the engineering profession, and SCU. Philip T. Go is the first-ever Chief Information Officer for Barton Malow Company. Gordon L. Stitt is President, Chief Executive Officer, and a co-founder of Extreme Networks, Inc.



Gordon L. Stitt

Sergio Zarantonello received the Adjunct Lecturer of the Year Award. George Fegan was awarded the Markle Award for Teaching Excellence and Tim Healy was given the School of Engineering Award for Teaching Excellence. Weijia Shang was named the Researcher of the Year for her scholarship. Richard Pefley, retired professor, was the recipient of the Lifetime Teaching Achievement Award. In addition, Tokunbo Ogunfunmi, was presented with the Researcher of the Year Award from the previous ceremony in 2003, which he was unable to attend. Moreover, Richard Weber was awarded the Outstanding Service Award for his dedicated service on the EAB.

The event sponsors included Hewlett-Packard, BAE Systems (formerly United Defense), AMD/Spansion, Intel, and Apple Computer. We are most grateful for their financial support and their

presence at the event, as well as the time each sponsor spent on making this a productive collaboration between it and the University.

We also thank the students and faculty who displayed their projects in the Mayer Gallery and took the time to present them to interested attendees.

Finally, we must acknowledge the leadership role assumed by the Engineering Alumni Board and the Office of New Initiatives and Partnerships from inception and detailed planning, to fundraising, organizing, and running the event.

For more information and photos, please visit: <http://www.scu.edu/engineering/about/engach.cfm>



Dr. T.J. Rodgers

An Amazing Year of Faculty Scholarship and Accomplishments *(Continued on next page)*

This article summarizes scholarship achievements of our school over the last academic year (2004-2005). It serves as an indication of the important accomplishments and contributions our faculty members have made to their profession in the advancement of the knowledge and their impact in the engineering community. Faculty scholarship also benefits our students by enriching the teaching materials and keeping our students informed of the latest technology. These recognitions and accomplishments improve our image and visibility nationally and internationally, and differentiate us from many teaching institutions. Over the past month, our faculty provided us with an overwhelming list of their many accomplishments. Although we can only provide a concise summary here, we are proud of the many accomplishments from our faculty.

Recognitions Received as Subject of a Scholarly Journal or a Newspaper Article: It was indeed a display of the highest respect from peers in the profession when **Drago Siljak** (Electrical Engineering) became the subject of a major scholarly mathematical journal, *Dynamics of Continuous, Discrete & Impulsive Systems* (Volume 11, Issues 2-3, April 2004). The journal has two parts (one in each issue): (A) Mathematical Analysis, and (B) Applications and Algorithms. Both were devoted to Siljak's 70th birthday, for a total number of 28 papers. The first paper, "An Overview of the Collected Works of Dragoslav Siljak," appeared as the first essay in the issue of Part A (essay posted on www.ee.scu.edu/eefac/siljak/p.htm). **Al Hoagland** (Electrical Engineering) was the subject of an article, "Remembering RAMAC," in *San Jose Mercury News* (May 26, 2005). He was also the subject of an article, "The Drive to Create," in the Fall 2005 issue of the SCU *Santa Clara Magazine* (article posted on www.scu.edu/scm/fall2005/hoagland.cfm). Hoagland was recognized as one of principal driving forces behind the development of magnetic storage technology. He was one of a small group of IBM engineers (led by Rey Johnson) who developed the first magnetic disk drive for data storage back in the 1950s. The Random Access Method of Accounting and Control (RAMAC) disk drive was created as a result of their effort. Today, Hoagland works hard to preserve this important piece of history.

Appointments to Major Leadership Positions: **Terry Shoup** (Mechanical Engineering) was named the 125th President of the American Society of Mechanical Engineers (ASME) for June 2006 - July 2007. ASME has 120,000 members worldwide and is the most influential mechanical engineering society in the world. In addition, Shoup was also appointed as Interim Dean for the SCU School of Education, Counseling Psychology, and Pastoral Ministries.

Most Influential Paper Published: At the most recent Computers and Information in Engineering Conference of the ASME, the Division celebrated its 25th year. As a part of this celebration, they published the titles and some of the papers that were regarded as the most influential 39 papers from the

period 1980 - 2000. A paper from **Terry Shoup**, "On the Use of a Hybrid Pattern Search Method for Design Optimization," in the proceedings of this conference in 1988, was listed as one of the most influential 39 papers.

Endowed Professorship: The academic year began with **Ruth Davis** (Computer Engineering) being named as the Robert W. Peters Professor, in recognition of her professionalism and dedication to engineering education and scholarship, and to her commitment to minorities and women in engineering.

University Awards: In this year's university faculty recognition, two of the eight university awards went to the School of Engineering. **Timothy Healy** (Electrical Engineering) was named the Faculty Senate Professor of the year. Healy's many accomplishments over decades of service were cited in his winning this award. Next year he will deliver the after-dinner address at the Faculty Rec-

ognition Dinner. **Nam Ling** (Computer Engineering) received a President's Faculty Special Recognition Award. Ling was cited for his teaching, curriculum innovations (including a course in building global teams), and his many publications and invited talks around the world.

New Books Published: **Mark Ardema** (Mechanical Engineering) completed two books in the last year. The first book, *Newton-Euler Dynamics*, published by Springer (2005), presents the basic definitions and principles of dynamics with the goal of enabling the reader to solve dynamics problems by Newton-Euler method. The second book, *Analytical Dynamics*, published by Kluwer/Plenum (2005), takes a classical approach to development of the methods of analytical dynamics. Both books have received excellent reviews.

Awards from Professional Organizations: The Institute of Electrical and Electronics Engineers

5 Siblings, 1 Engineering School

It is fascinating to note that five siblings from the Pargett family received their Bachelor's Degrees from SCU's School of Engineering.



Left to right: Dean Pitt, Douglas, Veronica (Mom), Timothy, John (Dad), Michael

Kathleen Pargett (BSCE '90) was a very committed, high achiever in grades, as well as in extra-curricular activities. She was also very active in the SWE and ASCE student chapters. Shortly after graduation, she went to work for CALTRANS. Currently, she and her husband Steve are raising two boys, John and Andrew, up in the foothills near Mountain Ranch, CA, nearby her parents and the original Pargett "ranch".

Stacy Pargett (BSME '91) was also very active in school activities, and an officer for the ASME student chapter. She is currently a mechanism design engineer, and is listed as an inventor on two patents, for the R&D division of Lexmark Printers in Kentucky.

Douglas Pargett (BSME '93, MSEM '05) recently co-authored two papers with Mechanical Engineering Professor, Dr. Mark Ardema, while an Engineering Management graduate student. Their research involved determining new ways to fly commercial transport airplanes to save fuel. He will return to work at NASA Ames Research Center this October. Recently, he and his wife Laura were blessed with a daughter named Sierra.

Timothy Pargett (BSME '02) created a novel closing mechanism to protect a telescope aperture as part of his senior design project. He was also an excellent Teaching Assistant for the Mechanical Engineering Department. Tim is working for CSA Engineering of Mountain View, CA in structural vibration control.

Mike Pargett (BSME '05) just recently graduated in June with a Bachelor's in Mechanical Engineering. While a student at SCU, he was a campus EMT. He is currently applying to medical schools and plans to pursue a career in biomedical engineering.

Patricia Pargett, the only non-SCU grad, did spend a summer doing biochemistry research with Santa Clara's Dr. Brunauer. She just finished her MD from Oregon Health Sciences University in Portland and will be pursuing Anesthesiology.

Interestingly, the parents of the Pargett grads, John and Veronica, had to stop their own college educations to support their family. They dreamed that one day all their children would eventually become college graduates but did not originally intend for 5 of their children to attend the same college. They also commonly thank the Jensens and the Lavaronis, family friends from the Calaveras foothill area, for recommending SCU, and pointing out that SCU would strive to help find the additional financial sources that would make the cost of attending affordable. Thus, we would like to acknowledge the parents of these five SCU grads, John and Veronica Pargett, for valuing the high quality of education that the School of Engineering has to offer by entrusting the School with the education of five of their children. Moreover, we look forward to seeing the next generation of Pargett engineers at SCU.

(IEEE) Educational Activities Board presented the IEEE Educational Activities Board Meritorious Achievement Award in Continuing Education to **Cary Y. Yang** (Electrical Engineering) for his "extensive and innovative contributions to the continuing education of working professionals in the field of micro/nanoelectronics." The IEEE is the largest technical professional organization in the world, with membership approaching 400,000. **Nam Ling** and his Ph.D. student Gunnar Hovden won the Best Paper Award (First Place Winner) from the IEEE International Conference on Consumer Electronics (ICCE) for their paper on MPEG-4 face animation. A paper by **John Noll** (Computer Engineering), coauthored with three others, "Multi-modal Modeling, Analysis, and Validation of Open Source Software Development Processes," won the award for Best Paper of the Conference, in First International Conference on Open Source Systems.

Faculty Promotions: This year, two members of our faculty received promotions. **Aleksandar Zecevic** (Electrical Engineering) became a full Professor and **Steve Chiappari** (Applied Mathematics) became a Senior Lecturer, for their accomplishments and dedications to teaching, scholarship, and service.

External Funding and Contracts: The Engineering School recently received a gift of \$1 million for undergraduate research, from Jack and Carmen Kuehler. Jack is an alumnus of the school and a former IBM President. The gift was inspired by **Silvia Figueira** and **JoAnne Holliday** (both Computer Engineering), whom he met at a donor's dinner and who are among the faculty members in engineering who have pioneered undergraduate research projects in recent years. This gift enables the school to institute its undergraduate research program in perpetuity to benefit more students and faculty. **Christopher Kitts** (Mechanical Engineering) and his Robotics Lab received a \$110,000 research and development grant from the ONYX Nanosatellite Program to develop a small 30 kg satellite prototype to demonstrate advanced technologies relating to autonomous control. In addition, Kitts also received a \$70,000 research and development grant to continue the development of the Mantis underwater robot. This work will allow SCU students to commission Mantis for operations to a depth of 500 feet and will be one of the most powerful shallow water robots on the West Coast. **Ruth Davis**, **Timothy Healy**, **Mark Aschheim** (Civil Engineering), and **Drazen Fabris** (Mechanical Engineering) received a grant of \$98,531 from the National Science Foundation (NSF) for the project, "CLEER: Community Learning Enabling Engineering Reform." In addition, Davis also obtained an equivalent of \$15,000 in equipment and software from HP, Microsoft, and National Instruments. **Silvia Figueira** received a \$30,000 subcontract award from 3DGeo, Inc. (U. S. Department of Energy funding) to support "Performance Monitoring, Prediction, and Run Time Adaptation of Grid Distributed Applications." **Cary Yang** received a NASA-Ames award

providing third year funding of \$24,000 to support "Modeling of Carbon Nanotube (CNT) Interconnects for High-Frequency Hybrid Si-CNT Integrated Circuits." The award with this amendment totaled \$72,000. This is a training grant award under NASA-Ames Graduate Student Researchers Program. In addition, **Edwin Maurer** (Civil Engineering) acquired a \$12,658 contract by the California Institute for Energy and Environment. **Thomas Schwarz** (Computer Engineering) received a Microsoft Research Grant of \$10,000. Besides external funding, many faculty members received internal grants within the university. Examples of recipients of the SCU Technology Innovation Grants include **Ruth Davis**, **Hans Peter Dommel** (Computer Engineering), and **Aleksandar Zecevic**.

Research Accomplishments in the Media: **Christopher Kitts** was featured on three Discovery Channel specials that were televised throughout the summer. The features involved a comparison of real robotics technology with systems seen in science fiction films such as Star Wars. **Edwin Maurer** appeared on KPIX-San Jose television newscast with Michelle Marvier (SCU Environmental Studies Institute) in summer to discuss climate change and California.

Research Achievements with Major Impact: The satellite program at SCU is highly active. **Christopher Kitts** and his Robotics Lab's partnership with UT Austin has led to the selection of two satellites to be launched by the U.S. Air Force (the FASTRAC Nanosatellite Program). The satellites are currently being planned for launch in late 2006. **Nam Ling** and **Weijia Shang** (both Computer Engineering), together with their Ph.D. students Xiaoquan (Bill) Yi and Jun Zhang, developed an improved and simplified fast motion estimation method that was adopted by the latest video coding international standard (the H.264/MPEG-AVC standard) in July 2005. **Mark Aschheim** has a co-authored (with C. Comartin) chapter on "Multiple Degree of Freedom Effects" in Improvement of Nonlinear Static Seismic Analysis Procedures, a report for the Federal Emergency Management Agency (FEMA).

Keynote Speeches: **Drago Siljak** delivered a keynote address, "Control of Complex Systems Under Information Structure Constraints: A Brief Review and New Results," at the Fourth International Conference on Engineering Applications and Computational Algorithms, in Guelph, Ontario, Canada, in July. **Samaha Mourad** (Electrical Engineering) delivered a keynote address at the WRLT Workshop in Japan last fall quarter as part of a month-long stay as a visiting scientist sponsored by the Japanese government.

National Engineering Event at SCU: **Shoba Krishnan** (Electrical Engineering) and the Institute of Electrical and Electronics Engineers (IEEE) student chapter of SCU organized and hosted the IEEE Region 6 Central Area Meeting and Micromouse

Competition as well as its student paper and design contests in Spring 2005. The event drew participants from industry and universities in California, Nevada, Idaho, and Hawaii.

Faculty Publications: As a community of teaching scholars, the school has published over a total of about 100 publications (2 books, about 30 journal papers, and about 70 conference papers and book chapters) over the year, among the 40 members of our full-time Engineering faculty. Many of these publications appeared in prestigious and major journals and conferences. We can only cite a few examples here: **Jorge Gonzalez** (Mechanical Engineering) has an article, "Urban Heat Islands Developing in Coastal Tropical Cities," in *Eos* of the American Geophysical Union (AGU). *Eos* is the leading and most important newspaper of AGU. The article occupies the entire top half of the front page of *Eos*. **Mark Aschheim** has a total of six journal publications in the area of earthquake and structural engineering in one year. Our faculty also published in areas outside traditional engineering: **Robert Parden** (Engineering Management) has a paper on "Collegial Leadership" in Portland, **Ruth Davis** has a chapter on community-based learning, **Steve Chiappari** and **Drazen Fabris** co-authored with **S. Zarantonello** an article in the math area, and **Sally Wood** (Electrical Engineering) was active in the areas related to the future of signal processing education and future directions, just to name a few.

Professional Activities: Many of our faculty members are active in their profession. Involvement in the profession enhances our visibility and influence. Our faculty members serve actively in professional organizations such as the Institute of Electrical and Electronics Engineers (IEEE), the American Society of Mechanical Engineers (ASME), the American Society of Civil Engineers (ASCE), and the Association for Computing Machinery (ACM). Their service positions include journal editors, technical and conference committee members, committee chairs, paper reviewers, and many others. Dean **Dan Pitt** (Computer Engineering) conducted a review of the Center for Networking Technology for the Information Economy in Sydney, Australia, as a guest of the Commonwealth Scientific and Industrial Research Organization. Pitt is a member of the Center's steering committee. At the National Science Foundation (NSF), **Sally Wood** and **JoAnne Holliday** participated in its panel reviews. Wood is also active in the evaluation of digital signal processing education. **Ruth Davis** was active in promoting women leadership, especially in technology. **Hans Peter Dommel** was a judge in the education panel of the Technology Benefiting Humanity Awards.

Final Note: Finally, it should be noted that the SCU School of Engineering supports its faculty scholarship through internal seed money grants and pilot research assistantships, and continues to foster and promote a rewarding scholarly environment for our faculty and students.