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Electrical and Computer Engineering Newsletter

Department of Electrical and Computer Engineering

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CALENDAR OF EVENTS

First Day of Classes
August 24, 2016



No Class—Labor Day
September 5, 2016



Mid-Term Break
October 6–9, 2016



Family Weekend
November 4–6, 2016



Thanksgiving Break
November 23–27, 2016



Fall Graduation
December 17, 2016

Chair's Corner *Dr. Guru Subramanyam*



Congratulations to the Class of 2016 graduates! We had an outstanding class of 2016 graduates with over 40 electrical and computer engineering majors graduating in May 2016. We had a record number of 10 doctoral students graduating from our department! Our graduates had excellent job offers and graduate school admissions.

I am also pleased that many of our outstanding undergraduates are continuing with us for the Bachelor's Plus Master's (bpm) program now being offered in the department. The master's in computer engineering program (CPE) completed its first year and already graduated its first student!

The program is proving to be popular as applications for the master's in computer engineering are growing quite rapidly.

The 2015–16 academic year has been a productive year for the department. We had two faculty searches conducted in the year, one in computer engineering and the other for the GE EPISCenter professor position. The computer engineering faculty search resulted in successful hiring of Dr. Feng Ye, an expert in wireless networks and network security. He joins us in the Fall of 2016. The GE EPISCenter position is in its final stages of hiring. We hope to reveal a world-class faculty member in the Fall of 2016 for this position. The GE EPISCenter professor will work closely with the GE EPISCenter and develop a research agenda in aerospace power systems and power electronics.

Congratulations to Dr. Keigo Hirakawa, who has been tenured and promoted to the rank of associate professor, effective August 16, 2016. On a sad note, we lost a colleague, a friend, a mentor, and a member of our industrial advisory committee, Mr. Larrell Walters in May 2016, due to a heart attack. Larrell will be remembered for all his contributions to the department over the past 10+ years. His major contribution is in establishing the Institute for Development and Commercialization of Advanced Sensor Technologies (IDCAST), which has become the signature program funded through the Ohio Third Frontier program. IDCAST has resulted in over 300+ new jobs in the state, and more than \$300 million in economic impact in Ohio. Please enjoy the articles on our department's new activities in this letter.



ECE Alumni Dr. Mark Moronell '83, Physician and Entrepreneur

The University of Dayton Magazine, Spring 2016 issue, contains an article about Electrical Engineering Graduate, Dr. Mark Moronell '83. Dr. Moronell “holds board certification in internal medicine, cardiovascular disease and nuclear cardiology.” He wrote a book, entitled *Succeeding in Healthcare Sales*, which was released in January of 2013. “He is the founder of Health Comm Strategies, a specialty consulting firm that assists companies, like hospitals, operate more efficiently within the health care sector.” Dr. Moronell has joined our ECE Industrial Advisory committee.



ECE 499: Contemporary Digital Systems at the UD China Institute

Prior to the start of the Spring 2016 semester, nine ECE students embarked on a two week, intensive educational experience in China, visiting the cities of Beijing, Shanghai, and Suzhou. During those two weeks, students enrolled in a three credit hour course entitled “Contemporary Digital Systems” that counted toward their electrical or computer engineering degree program. In the class, students learned modern day digital systems’ design and the use of many advanced digital design tools such as Altera’s synthesis tool, Quartus, as well as Mentor Graphic’s simulation tool, Modelsim. By the end of the class, students were able to complete many digital designs, verify correct functionality of their designs with Modelsim, synthesize their designs onto programmable logic devices, and operate those designs in real-time!

Additionally, the class was able to tour three industrial facilities in Suzhou, namely Higer Bus, Black & Decker tools, and Marian Die Cutting Facility, where students were able to see first-hand the effects of engineering on industry. During the trip, students were also able to see some of the amazing sites of China such as the Great Wall, Emperor’s Summer Palace, and the Shanghai Tower.

Seyed Ataollah Raziei Awarded the 2016 Krishna M. Pasala Ph.D. Memorial Scholarship

The Institute of Electrical and Electronics Engineers (IEEE) Dayton Section is pleased to announce the 2016 award of the Krishna M. Pasala, Ph.D. Memorial Scholarship to Seyed Ataollah Raziei. The subject memorial scholarship is awarded annually to a graduate student attending the University of Dayton within the Department of Electrical and Computer Engineering. The scholarship award is based on academic excellence in the area of electrical engineering and includes a prize of up to \$1,000. We congratulate Seyed on the winning of this award on behalf of the IEEE Dayton Section and the IEEE Foundation. He was presented his award at the IEEE Dayton Banquet on April 30, 2016.



UD's Vision Lab Work Featured on WVXU Radio!

California-based Pacific Gas & Electric has given UD's Vision Lab \$254,362...

On Monday, March 21 Ann Thompson, reporter and mid-day host for WVXU radio, gave UD a shout out for their research in computer software that helps in detecting oil and gas pipeline threats. She said, "California-based Pacific Gas & Electric has given UD's Vision Lab \$254,362 to help researchers continue to create an automated monitoring system for building change detection on pipeline corridors by processing and transmitting images in virtual real time."



Webinar on MEMS Research

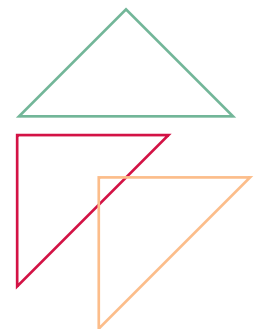
Dr. Vamsy Chodavarapu gave a webinar on February 23, 2016, offered by CMC Microsystems, a provider of Coventor's micro-electrical-mechanical (MEMS) design solutions. The webinar was entitled *Leveraging MEMS Prototyping Platforms for Research and Commercialization* and focused on reviewing the development of many MEMS devices, using the MIDISTM fabrication process. There was also a discussion on micro electrostatic actuators being fabricated using the Micralyne MicraGEM-SiTM .



Undergraduate Student Devin Spatz Receives the University Innovation Fellowship Award

Devin Spatz, a senior in electrical engineering, was nominated by the Department of Electrical and Computer Engineering to be a candidate for the prestigious University Innovation Fellows (UIF) program. After a rigorous application process and an eight-week training program, he was recognized as an official Fellow—one of the only 607 in the United States from more than 140 universities. Stanford's Epicenter and VentureWell administrated the UIF program, with financial support from the National Science Foundation and the Kern Entrepreneurial Engineering Network (KEEN). Devin was part of a KEEN leadership circle of five UD engineering students. Following the UIF training, Devin traveled to the UIF Meet Up in Silicon Valley where he and 300 other students participated in an intensive, three-day series of workshops at Stanford's Design School, Google and Microsoft.

Congratulations Devin!





A Meeting With The Ruler of Dubai

Dr. Vijayan Asair had a unique opportunity to visit His Royal Highness Sheikh Mohammed bin Rashid Al Maktoum, the ruler of Dubai and vice president of the United Arab Emirates at his palace while he was in Dubai during the week of April 18. Dr. Asari was participating in a conference when Dr. Issa Salim, head of the Bioresonance Clinic at Rashid Hospital took the initiative for this meeting. The pair has discussed a long-term vision about initiating a research collaboration for the development of brain wave based bio-medical diagnosis and treatment systems.



UDRI Exceptional Performance Awards

In the March/April 2016 UDRI Research Leader publication, a number of professional researchers earned Exceptional Performance Awards in 2016. The award recognizes and rewards exceptional performance that results in sustained organizational growth; significant sponsorship from new or existing customers or in new technology areas; and enhancement of UDRI's reputation. Among these winning researchers were ECE adjunct faculty members Jitendra Kumar, Paul Kladitis, Nilesh Powar, and Bang-Hung Tsao.

2015-2016

Faculty Publications, Awards, Achievements, Patents

Paheding Sidike, **Vijayan K. Asari**, and Mohammad S. Alam, “Multiclass object detection with single query in hyperspectral imagery using class-associative spectral fringe-adjusted joint transform correlation,” *IEEE Transactions on Geoscience and Remote Sensing (TGRS)*, DOI: 10.1109/TGRS.2015.2476480, vol. 54, no. 2, pp. 1196-1208, 2015.

Vijayan K. Asari, “Wide area surveillance: Situational awareness for security automation,” *Journal of Information Technology & Software Engineering*, DOI: 10.4172/2165-7866.S1.002, September 2015.

Theus Aspiras, **Vijayan K. Asari**, and Wesam Sakla, “Gaussian nonlinear line attractor for learning multidimensional data,” *International Conference on Neural Computations Theory and Applications—NCTA 2015 (In conjunction with the 6th International Joint Conference on Computational Intelligence—IJCCI 2015)*, Lisbon, Portugal, 12–14 November 2015.

Theus H. Aspiras, **Vijayan K. Asari**, and Wesam Sakla, “Learning a synthetic vehicle database using the Gaussian nonlinear line attractor network,” *IEEE Applied Imagery Pattern Recognition workshop—AIPR 2015*, Washington DC, USA, October 13–15, 2015.

Nina Varney, Yakov Diskin, and **Vijayan K. Asari**, “Automatic registration of LiDAR scenes for change detection applications,” *IEEE Applied Imagery Pattern Recognition workshop—AIPR 2015*, Washington DC, USA, October 13–15, 2015.

Kevin Krucki and **Vijayan K. Asari**, “Human re-identification using computer generated renderings,” *IEEE Applied Imagery Pattern Recognition workshop—AIPR 2015*, Washington DC, USA, October 13–15, 2015.

Daniel Prince, Andrew Sutter, Mark Edmonds, Matthew Cusumano, Wenjie Lu, and **Vijayan K. Asari**, “Brain machine interface using Emotiv EPOC for controlling a robotic arm,” *IEEE National Aerospace & Electronics Conference & Ohio Innovation Summit—NAECON—OIS 2015*, Dayton, Ohio, 16–19 June 2015.

Vijayan K. Asari, “Meeting the Challenges in Wide Area Surveillance: Automatic Object Detection, Tracking and Identification in Complex Environmental Conditions,” *IEEE Applied Imagery Pattern Recognition workshop—AIPR 2015*, Washington DC, USA, October 13–15, 2015.

Vijayan K. Asari, “Brain signal analysis for human emotion recognition and brain machine interface,” (*Keynote Talk*), Global Summit and Expo on Multimedia and Applications, Birmingham, United Kingdom, 10–11 August 2015.

D. A. Shaffer, A.M. Kordik, D.M. Walker, **E. J. Balster**, and W. F. Turri. “Image Back-Projection: A Hardware Implementation”, in Proc. IEEE National Aerospace and Electronics Conference. Dayton, OH, June 16–19, 2015.

J.M. Headlee and **E. J. Balster**. “A No-Reference Image Enhancement Quality Metric and Fusion Technique”, in Proc. International Conference on Image and Vision Computing New Zealand. Auckland, New Zealand, Nov. 23–24, 2015.

2015-2016

Faculty Publications, Awards, Achievements, Patents

F. Mohamed and **M.R. Chatterjee**, “Spectral and performance analysis for the propagation and retrieval of signals from modulated chaos waves transmitted through modified von Karman turbulence,” FiO 2016, San Jose, CA. *OSA Technical Digest*, article # JTU4A.31 (18–22 Oct. 2015).

M.R. Chatterjee and F. Almeahmadi, “Secure transmission and retrieval of images in conjunction with steganography using chaos in nonlinear acousto-optic feedback,” NLO 2015, *OSA Technical Digest*, Kauai, Hawaii, article # NF1A.6 (26–31 July, 2015).

M.R. Chatterjee and F. Almeahmadi, “Secure transmission of static and dynamic images via chaotic encryption in acousto-optic hybrid feedback with profiled light beams,” *Photonics West 2016*, San Francisco, CA. Proc. SPIE 9387, 938711-1-10 (Feb. 2015).

M.R. Chatterjee and F. Mohamed, “A Transfer Function Based Frequency Model for Propagation of a Chaos Wave through Modified von Karman Turbulence under Various Chaos and Turbulence Conditions,” OSA Topical Meeting, Arlington, VA. *OSA Technical Digest*, article # PT4C.2 (June 19, 2015).

M.R. Chatterjee and T. Algadey, “Investigation of electromagnetic velocities and negative refraction in a chiral metamaterial with second-order material dispersion using spectral analyses and dispersive models,” *Opt. Eng.*, 54(3), 037108 (March 2015).

T. Algadey and **M.R. Chatterjee**, “Emergence of Negative Index in a Lossy Chiral Metamaterial under First-Order Material Dispersion,” OSA Topical Meeting, Boston, MA. *OSA Technical Digest*, article # NM2C.5 (June 2015).

B. O. Abayowa, A. Yilmaz, and **R. C. Hardie**, “Automatic registration of optical aerial imagery to a LiDAR point cloud for generation of city models,” *ISPRS Journal of Photogrammetry and Remote Sensing*, Vol. 106, Aug. 2015.

K. M. Mohamed and **R. C. Hardie**, “A Collaborative Adaptive Wiener Filter for Multi-Frame Super-Resolution”, *Frontiers in Physics: Optics and Photonics*, 3:29. doi: 10.3389/fphy.2015.00029. (This article is part of the research topic “Modern Trends and Applications of Super-resolution Imaging”), April 29, 2015.

R. C. Hardie, D. R. Droege, A. J. Dapore, and M. E. Greiner, “Impact of detector-element active-area shape and fill factor on super-resolution,” *Frontiers in Physics: Optics and Photonics*, 3:31. doi: 10.3389/fphy.2015.00031. (This article is part of the research topic “Modern Trends and Applications of Super-resolution Imaging”), May 18, 2015.

J. Malas, J. Cortese, P. Ryan “Uncertainty Propagation and the Fano Based Information Theoretic Method” Invited Paper, IEEE proceedings to the 2015 IEEE Radar Conference, Arlington, Virginia Security, Waltham, MA, April, 2015

2015-2016

Faculty Publications, Awards, Achievements, Patents

M. Vakil, D. Megherbi, **J. Malas**, “An efficient multi-stage hyper-spectral aerial image registration technique in the presence of differential spatial and temporal sensor uncertainty with application to large critical infrastructures & key resources (CIKR) surveillance” IEEE proceedings to the International Symposium for Technologies for Homeland Security.

S. Wang, **E. Shin**, G. Subramanyam, W. Wang, K. Leedy, T. Quach, and C. Cerny, “A resonant circuit realization using a 3D inductor in combination with thin film varactor technology,” Proceedings of *SPIE*, vol. 9667, International Workshop on Thin Film for Electronics, Electro-Optics, Energy, and Sensors, 966705, Nov, 2015.

S. Wang, W. Wang, **E. Shin**, C. Yakopic, T. M. Taha, and G. Subramanyam, “Lithium Based Memristive Devices,” Aerospace and Electronics Conference, NAECON 2015—IEEE National, June 2015.

Mani, Nilan; S. Kim, Steve; Annam, Kaushik; Bane, Danielle; **Subramanyam, Guru** “Creation of carbon nanotube based biosensors through dielectrophoretic assembly,” *Proceedings of SPIE—The International Society for Optical Engineering*, v 9557, 2015, Nanobiosystems: Processing, Characterization, and Applications VIII

Kumar, Jitendra; Ouchen, Fahima; Smarra, Devin A.; **Subramanyam, Guru**; Grote, James G. “DNA based electrolyte/ separator for lithium battery application” *Proceedings of SPIE—The International Society for Optical Engineering*, v 9557, 2015, Nanobiosystems: Processing, Characterization, and Applications VIII

Fahima Ouchen, Donna M. Joyce, Emily M. Heckman, Carrie M. Bartsch, Roberto S. Aga, Jr., Jack P. Lombard III, Saima Husaini, Robert G. Bedford, Emily M. Fehrman Cory, Steve S. Kim, Rajesh R. Naik, Perry P. Yaney, Ileanu Rau, Francois Kajzar, **Guru Subramanyam**, Adrienne D. Williams, and James G. Grote, “Bio-Based Nano Materials for Photonic and Electronic Applications”, *Plenary Lectures in Nanoscience and Engineering*, edited by David L. Andrews and James G. Grote, SPIE Press, 2015.

G. Subramanyam, “Industry-University Collaboration: University of Dayton Model”, *Journal of Engineering Education Transformations*, v 29, no.2, pp. 9-13, 2015.

J. Kumar, P. Kichambare, A. Rai, P. Bhattacharya, S. Rodrigues, **G. Subramanyam**, “A high performance ceramic polymer separator for lithium batteries”, *Journal of Power Sources*, v 301, pp. 194-198, 2016.

Miniaturized and reconfigurable CPW square-ring slot antenna including ferroelectric BST varactors Jiang, Hai; **Subramanyam, Guru** Assignee: University of Dayton Publication Number: US8957817 Publication date: 02/17/2015 Kind: Patent

Varactor shunt switches with parallel capacitor architecture **Subramanyam, Guru** Assignee: University of Dayton Publication Number: US9000866 Publication date: 04/07/2015 Kind: Patent

2015-2016

Faculty Publications, Awards, Achievements, Patents

C. Yakopcic, R. Hasan, and T. M. Taha, “Hybrid Crossbar Architecture for a Memristor Based Cache,” *Microelectronics Journal*, vol. 46, no. 11, pp. 1020-1032, November, 2015.

C. Yakopcic and T. M. Taha, “Determining optimal switching speed for memristors in a neuromorphic system,” *Electronics Letters*, vol. 51 no. 21, pp. 1637-1639, 2015.

C. Yakopcic, T. M. Taha, M. R. McLean, “Method for ex-situ training in a memristor-based neuromorphic circuit using a robust weight programming method,” *Electronics Letters*, vol. 51, no. 12, pp. 899-900, 2015.

C. Yakopcic, T. M. Taha, G. Subramanyam, and R. E. Pino, “Impact of Memristor Switching Noise in a Neuromorphic Crossbar” IEEE National Aerospace and Electronics Conference, June, 2015.

R. Uppala, **C. Yakopcic**, T. M. Taha, “Methods for Reducing Memristor Crossbar Simulation Time” IEEE National Aerospace and Electronics Conference, June, 2015.

C. Yakopcic, T. M. Taha, “Ex-Situ Programming in a Neuromorphic Memristor Based Crossbar Circuit” IEEE National Aerospace and Electronics Conference, June, 2015.

S. Wang, W. Wang, E. Shin, **C. Yakopcic**, G. Subramanyam, T. M. Taha, “Lithium Based Memristive Devices” IEEE National Aerospace and Electronics Conference, June, 2015.

C. Yakopcic, R. Hasan, T. M. Taha, and D. Palmer, “SPICE Analysis of Dense Memristor Crossbars for Low Power Neuromorphic Processor Designs” IEEE National Aerospace and Electronics Conference, June, 2015.

R. Hasan, **C. Yakopcic**, and T. M. Taha, “Ex-situ Training of Dense Memristor Crossbar for Neuromorphic Applications,” IEEE / ACM International Symposium on Nanoscale Architectures, 2015.

C. Yakopcic, R. Hasan, and T. M. Taha, “Memristor Based Neuromorphic Circuit for Ex-Situ Training of Multi-Layer Neural Network Algorithms,” IEEE IJCNN, 2015.

2015-2016

Awards and Achievements

FACULTY AND STAFF

The Department of the Air Force Award for Exemplary Service, 2015 was awarded to

Dr. John Malas

The Department of the Air Force Outstanding Civilian Career Service Award, 2015 was awarded to

Dr. John Malas

The Department of the Air Force Special Act Award, 2015 was awarded to

Dr. John Malas

The Sigma Xi George B. Noland Award for Outstanding Research was awarded to

Dr. Vijayan Asari

Dr. Keigo Hirakawa

was promoted to Associate Professor with tenure

Dr. Eunsung Shin,

joined the department as a senior research scientist in January 2016. Previously, he was in UDRI as a research scientist in the Energy Systems Division.

STUDENTS

The Anthony Horvath, '22 and Elmer Steger, '22 Award of Excellence to the Outstanding Senior in Electrical Engineering was awarded to

Andrew D. Bolubasz

The Brother Louis H. Rose, S.M., '33 Award of Excellence to the Outstanding Junior in Electrical Engineering was awarded to

Kevin R. McElroy

The Electrical and Computer Engineering Graduate Student Showcase Award was awarded to

Matthew Sprague

The Thomas R. Armstrong, '38 Award of Excellence for Outstanding Electrical Engineering Achievement in Memory of Brother Ulrich Rappel, S.M. and E. Frank Armstrong was awarded to

Devin A. Smarra

The Mary C. Millett Endowment Award for the Outstanding Senior Electrical and Computer Engineering Student in memory of Mary C. Millette was awarded to

Emma L. Romstadt

Congratulations to all the award winners!

May 2016

Graduates

BACHELOR'S DEGREES AWARDED

Kyle Pete Abel	Tyler J. Hart	Emma Leigh Romstadt
Yousuf Abdulrahman Al- Ghazal	Farah Helal	Edward Clark Ruff III
Saeed Fahad Alquraishi	Qi Huang	Garrett Craig Sargent
Saud W A A M Alrumaih	Emma Catherine McClory	Devin Alexander Smarra
Abdullah Abdulraheem Alshemali	Conrad Richard Merling	Devin William Spatz
Andrew David Bolubasz	Jumana Abdulhameed Moqaddam	Kathryn Marie Steller
Kaihmeelah Wallesha Bonham	Brian J. Mormon	Tyler C. Tamburlin
Andrew D. Braun	Benjamin Edward Natarian	Zachary E. Tencza
Cory James Bucksar	Jacqueline Ashley Nolan	Craig Patrick Timms
Jeffrey Scott Cripe	John P. Overly	Kevin M. Waldron
Victoria Lynn Diculo	Erin L. Patterson	Dana Suzanne Walsh
Pu Gao	Matthew Allyn Pierce	Xiaoyan Zhang
Henry Michael Garrett	Anthony Joseph Reiling	Shuyue Zhang
David James Geck	Kevin Christopher Rodenbeck Jr.	

MASTER'S DEGREES AWARDED

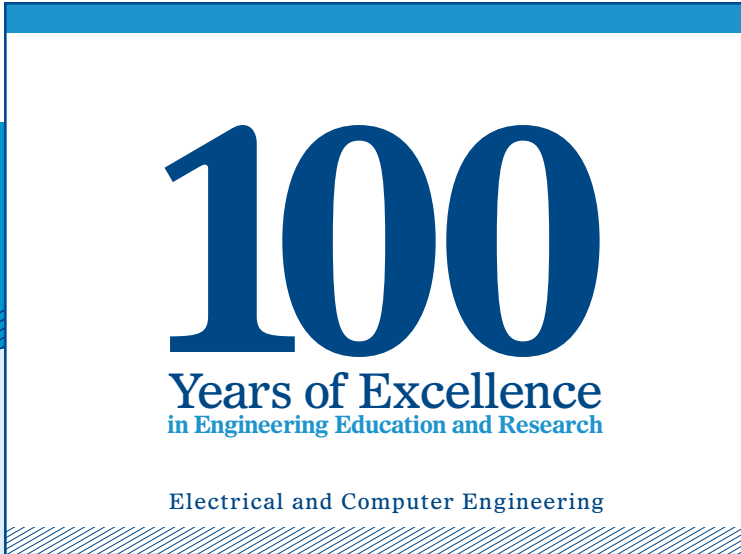
Saad Hussain Alshahrani	Pranathi Gona	Mohammed Imran Ahmed
Prathusha Bodhanker	Sagarika Gunjari	Jonathan D. Power
Alexander James Boytim	Chethan Kanth Jalli	Prashanth Ramagiri
David Eugene Brendel	Bhanu Raghavendra Kollimarla	Manoj Kumar Sharma
Kelly Anne Cashion	Akash Kota	Andrew David Thompson
Yi Te Chu	Naga Sai Babu Kongara	Sai Lakshmi Vasireddy
Motaz Deebes	Kang Li	Bin Zhang

DOCTORATE DEGREES AWARDED

Hamdi Abdelbagi	Md Raqibul Hasan	Shu Wang
Tarig Abobaker Algadey	Patrick C. Hytla	Zhenyu Yang
Tanvir Atahary	Abdulmajid Abdussalam Mrebit	
Joseph C. French	Ali H. Nassib	

Announcing the ECE Centennial Book

It is with great pleasure that we announce the completion of the book 100 Years of Excellence in Engineering Education and Research: Electrical and Computer Engineering. The book highlights the humble beginnings of the electrical engineering department at UD in 1911. It chronicles the growth of the department and the people that were instrumental in making this program what it is today. The book is available to all our alumni, parents, students and friends for \$25 each. To place an order for your copy please fill out the order form below.



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