



University of
Dayton

The Department of

ELECTRICAL AND COMPUTER ENGINEERING

Winter 2019

CALENDAR OF EVENTS

March 8–17

Spring Break begins
after last class



April 17–22

Easter Recess begins
after last class



April 24

Bro. Joseph W. Stander
Symposium – Alternate Day
of Learning



May 3

Last day of class



May 6–10

Exams – Spring Term ends
after final examination



May 11

Doctoral/Graduate
Commencement Exercises
at 12:45 PM



May 12

Undergraduate
Commencement Exercises
at 9:45 AM



Chair's Corner *Eric Balster*

We have had a tremendous start to the 2018-2019 academic year with a record amount of new research funding as well as a number of awards honoring our faculty. Since my appointment in July, our department has secured over 1.5 million dollars in newly funded research efforts. Our faculty continue to amaze me with their dedication to scholarly activity.

Over the summer, Dr. Tarek Taha received the 2018 Fritz J. Russ Bio-Engineering Award at the Dayton Section annual IEEE awards banquet. Dr. Taha received this prestigious award for his pioneering work in the field of neuromorphic computing. Congratulations Tarek!

In September, Dr. Vamsy Chodavarapu became the university nominee for the 2019 Blavatnik National Awards. This nomination is university-wide for all engineering and physical sciences faculty. His nomination will be submitted for the National Award for potential selection as a Blavatnik Laureate in the Physical Sciences and Engineering. Let's wish Vamsy the best of luck!

We have some notable work milestones to celebrate this year. At the start of the academic year, Dr. Russ Hardie completed 25 years of service to the ECE department, and Dr. Guru Subramanyam completed 20 years of service in ECE. Thank you both to Russ and Guru for their dedication to the university and our students over multiple decades! Additionally, I have just completed 10 years at UD.

It has been a very humbling and rewarding experience to serve as chair over the past four months. Thank you to everyone who has provided support and consultation to me as I settle into this new role. The university administration, faculty, staff, and students have been extremely helpful and encouraging. Thank you to all of you who support the department, and I hope to serve you well in the years to come.



Students in the News

➡ Graduate Student, Ming Gong, Featured For Arctic Ice Research



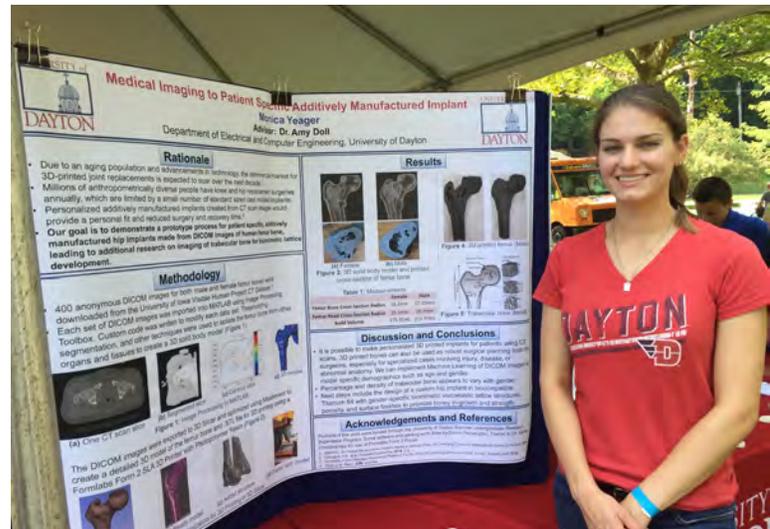
Ming Gong, a graduate student in Electrical and Computer Engineering who was featured on the university website for her research in the northern most city in the US. The “cool” summer project was partnered with different universities from all over the globe: University of Alaska Fairbanks, University of Calgary in Canada and the University of Tromso in Norway. Gong was the first UD student to take part in such a competitive program. She was also able to learn and practice technical skills that are useful for her degree while in this program.

To learn more about the program and Ming Gong’s experience see: <https://www.udayton.edu/blogs/engineering/2018/18-11-15-ming-gong-et-ece-arctic.php>

➡ Medical Imaging-to-Custom Prosthetic Implant Research



Manoj Sharma, Nathan Doll, Amy Doll, Matthew Doll, Monica Yeager



Monica Yeager

Undergraduate ECE student **Monica Yeager** and Dr. Amy Doll developed image processing techniques to create 3D models from DICOM images of patient specific CT scans. These techniques can be used to create customized prosthetic implants through additive manufacturing (AM) in biocompatible metals such as Titanium (Ti.64) in the future. Dr. Doll is working with UDRI to develop an open-architecture, FDA-approved

laser-powder bed fusion (L-PBF) medical-grade AM machine. This work was exhibited at the Dayton Maker’s Faire at Carillon Historical Park in UD’s inaugural booth at the event, coordinated by **Dr. Doll, Monica Yeager, and Manoj Shama** in August 2018. Monica also had the opportunity to present her research to President Spina and the University of Dayton Board of Trustees in September 2018.

For more details of Dr. Amy Doll’s research see the following link.

<https://udayton.edu/momentum/#!/stories/amy-doll-medical-devices.php>

Mechatronics Day with Ruskin Elementary



ECE undergraduate (*now graduate*) student **Samantha Rennu** organized a robotics learning module with students of Ruskin Elementary School, where she volunteers as a STEM instructor. Students in grades 3-5 were given the opportunity to learn about semi-autonomous Arduino-based robots created in Dr. Doll's *Introduction to Mechatronics* course, and cheer on their favorite robot in several rounds of "sumo-bot" competitions with UD students.

Lockheed Martin Utilizing University of Dayton Research for Next Generation Converged Sensors Program

DAYTON, Ohio – Lockheed Martin has licensed technology developed in part by a University of Dayton team led by electrical and computer engineering professor Guru Subramanyam to test whether it can work with sensors to eliminate interference from sources that would otherwise degrade the performance of the sensors.

Subramanyam's tunable varactors are made of a thin, ceramic film that is less expensive than silicon-based devices. Very low battery-powered voltage changes manipulate the electrical properties of the film to switch the frequencies that allow the use of different gadgets and improve signal reception.

Originally developed to cut the number of filters used to sort frequencies in cell phones, TVs and satellite communication systems, the varactors have evolved

to support rapid reconfiguration of radio frequency and microwave sensors conducting simultaneous operations.

"This technology attracted attention at the World's Best Technologies and TechConnect forums that focus on the world's most promising technologies and of cell phone makers Ericsson, Qualcomm and Nokia when we first developed it a decade ago," Subramanyam said.

If the sensor demonstration proves successful, Lockheed Martin and the UD team could move to a second phase that includes mass production of the varactors.

UD works with the Air Force Research Lab at Wright-Patterson Air Force Base to make the devices and Indiana Microelectronics and 3D Glass Solutions on design and testing.



To read more about the Lockheed Martin/ University of Dayton collaboration on this project please visit: https://www.udayton.edu/news/articles/2019/02/guru_subramanyam_lockheed_martin_varactor_license.php

New Course in Biomedical Engineering Offered

This course provides an introduction to Special Topics in Biomedical Engineering. An overview of anatomy and physiology, biomimetics, cardiac and skeletal muscle biomechanics, biomaterials & tissue engineering, biosensors, bioinstrumentation, neuroscience, biomedical modeling, medical imaging, robotics in medicine, and biomedical additive manufacturing is provided. Students have the opportunity to attend industry site visits with internal and external partners in the medical field to apply knowledge learned in the classroom to real-world experiences. During Fall Semester 2018, several site visits were made to Miami Valley Hospital.



Electrical engineering design challenges in avionics and air transport (Care Flight, October 2018) Electrical



engineering challenges in the trauma unit (Miami Valley Hospital, November 2018)

Blaise Gassman and Ryan Kronk Recognized as Recipients of the IEEE PES Scholarship Plus Initiative



Blaise Gassman



Ryan Kronk

ECE students, Blaise Gassman and Ryan Kronk were recipients of the IEEE Power and Energy Society (PES) scholarship for 2018-2019 academic year. The initiative recognizes undergraduate students who have declared a major in electrical and computer engineering, are high achievers with strong GPAs with distinctive extracurricular commitments, and are committed to exploring the power and energy field. Congratulations to Blaise and Ryan for this achievement!

Dr. Feng Ye receives the “SOCHE Award for Faculty Excellence”



On November 9, 2018 Dr. Feng Ye received the “SOCHE Award for Faculty Excellence”. SOCHE hosts an annual banquet to honor the year’s winners of the Award for Faculty Excellence. The faculty are picked by officers at each intuition. Special considerations for excellence is demonstrated in teaching, service, and scholarship throughout the academic year. Congratulations Dr. Feng Ye!



For more information visit

<https://www.soche.org/faculty-awards-banquet-2018/faculty-awards-banquet-winners-2018/>



Faculty in the News

⇒ ECE Faculty Featured on UD's Research Website for their ground-breaking research



Dr. Asari

Dr. Vijayan Asari's team developed new algorithms and technologies to detect threats to facilities like gas lines. The software analyzes satellite images to find changes in the environment and communicates the findings to the utility company for additional follow-up. The system helps combat human fatigue and error when conducting such meticulous comparisons – improving both safety and performance.

For additional details about Dr. Asari's research visit

<https://udayton.edu/momentum/#!/stories/vision-for-safety.php>



Dr. Taha

Dr. Tarek Taha won his third National Science Foundation award. He is hoping this award will play a key role in developing a brain-inspired chip that is capable of learning by itself. This chip will also be more efficient and compact, and more secure than current chips. The chip will help pave the path for making robots on a smaller scale, among other things. Through his research Taha uses a memristor, a type of nanoscale device, which allows for memory to be retained without utilizing power. Taha and his group are currently working on designing a computer chip that will perform to the equivalence of a super computer by consuming one million times less energy.

To look deeper at Dr. Taha's research visit <https://udayton.edu/momentum/#!/stories/deep-learning-tarek-taha.php>

ECE Industrial Advisory Committee Member, Dr. Hao Huang, Recipient of 2019 IEEE Award

Dr. Hao Huang, a member on our Industrial Advisory Committee, is the recipient of the 2019 IEEE Transportation Technologies Award. We would like to congratulate him on his award!



List of December 2018 Graduates

Undergraduate

CPE

- Alabdullah, Naser B.
- Brown, John P.
- Hoffmire, Matthew A.
- Miller, Owen T.
- Niese, Dylan P.
- Oross, Matthew S.
- Paulick, Austin D.
- Shoemake, Jordan L.
- Vassilo, Kyle T.

ELE

- Al Dhahouri, Hazaa M.
- AlMaskari, Almuaayad S.
- Alansari, Shahd A S A
- Alazemi, Abdulaziz
- Alhawaj, Ahmad
- Alkhalidi, Hessah N M A S
- Alkuraydis, Meshaal M.
- Almoosawi, Sayed Hashim A S H S Z S A
- Alsarraf, Abdulhady A K H
- Alshehri, Khalid Dhafer A
- Alsubaiei, Abdullah H.

- Cunningham, Eric T.
- Fisher, Lindsey N.
- Ghanem, Raghad Munshi
- Harvey, Malia C.
- Nussman, Dayne P.
- O'Brien, Christopher W.
- O'Malley, Patrick E.
- Rennu, Samantha R.
- Ricci, Christopher D.
- Siliunas, Paulius A.
- Daluom, Abdulhakim A.
- Gnawali, Rudra
- Krieger, Evan W.

Masters

CPE

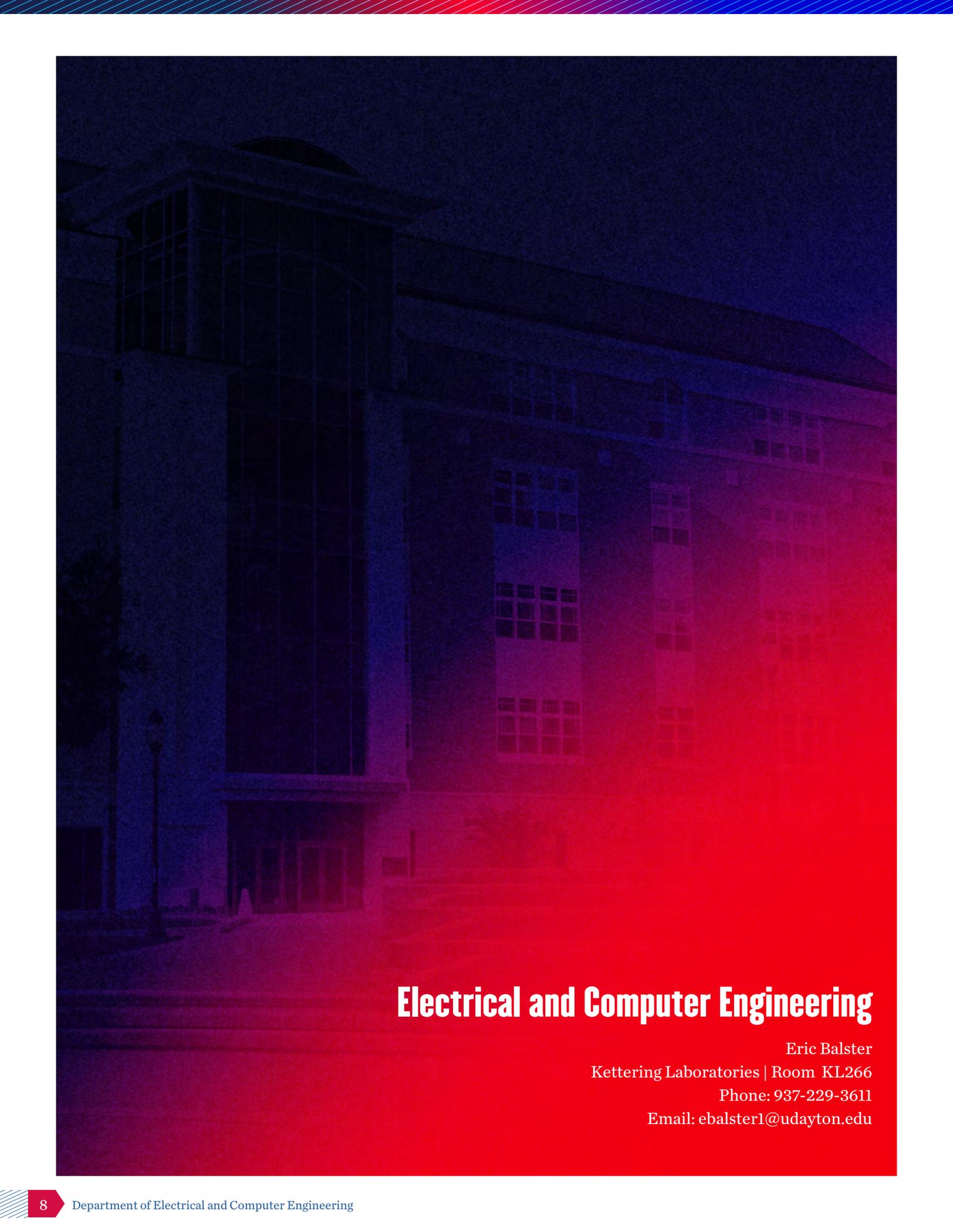
- Penugonda, Eswaramba Sai Nivedita
- Sorg, Bradley R
- Sullivan, Kelsea N
- Thomann, Arthur
- Westberg, Stefan A

ELE

- Aboujaoude, Andrea E.
- Alanazi, Mubarak Alayyat
- Alenezi, Hamdan
- Alkhudair, Amani
- Alrashidi, Mohamed Abdallah
- Buerkle, Daniel N.
- Cheruku, Satya Pratikshreddy
- DiMascio, Michelle A.
- Faruq, Md Omer
- Karanam, Sai Sravani
- Mariboyina, Kavya Sree
- McNally, Branden
- Soto-Barreto, Melvin X
- Tefoung, Armel
- Udayakumar Sherly, Arjun
- Zhang, Zhihao
- Zhao, Kangcheng

Ph.D.

- Alom, Md
- Alsuwian, Turki M.
- Pan, Kuan-Chang
- Ragb, Hussin K.



Electrical and Computer Engineering

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