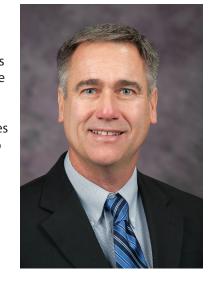# ECE UPLINK

FROM THE DEPARTMENT HEAD

Welcome to the summer 2021 edition of Uplink, our annual print newsletter from the Mike Wiegers Department of Electrical and Computer Engineering. It has been nearly 15 months since COVID-19 drastically affected the way we operate and deliver education to our students, as well as deal with its effect on our research operations. Transitioning from full remote into hybrid, and then back to in-person, has created challenges for our faculty, staff and students. But I believe we did the best we could under the circumstances. Working with fewer faculty and an increasingly constrained budget brought its own set of obstacles as well. We look forward to the upcoming academic year where we hope for a return to our normal mode of delivering quality education. This year has also seen administration changes with Matt O'Keefe becoming our new dean of engineering in summer 2020 and the recent announcement by President Myers that he is retiring at the end of this year.

Even in the difficult times of COVID-19, it was great to see how two ECE faculty stepped up to meet the needs of our community and nation. Professor Jungkwun Kim re-purposed some of his laboratory for the ability to print nasal swabs to be used by hospitals and clinics in our region. Professor Caterina Scoglio and her team worked on computer models to predict the spread of COVID-19 in our communities under different conditions. Both have made an impact and their efforts are greatly appreciated. Our research faculty, staff and graduate students did an outstanding job of continuing their work in the best way possible during the pandemic. This included maintaining activities in critical on-campus research labs as well meeting the challenges faced by many graduate students and faculty who worked remotely for an extended period. This newsletter highlights accomplishments of our excellent faculty. On a related effort, earlier this spring a number of energy and power graduate students, along with their advisor Professor Behrooz Mirafzal, hosted the second annual Kansas Power and Energy Conference. This student-run conference was started by our power students and faculty in 2020. This group did a great job with a virtual event but are looking forward to hosting the conference in person in 2022.

Our students continue to do great things even in the midst of a pandemic as once again we had a large number of graduates at the B.S., M.S. and Ph.D. degree levels. Several of our graduate students and undergraduates received awards at various stages of their degree pursuits. We also continued our strong senior design program with more than 75 students demonstrating their projects during the Senior Design Expo held near the end of each semester. Starting this spring 2021 semester, we were able to begin providing awards to our top teams at this event due to the generosity of ECE alum Roger Riggert.

Finally, it was great to be able recognize several ECE alumni during the virtual 2021 Seaton Society celebration. Mike Wiegers was inducted into the College of Engineering Hall of Fame, while Mackenzie Martin and Mark Troutfetter were recognized as Professional Progress Award recipients. I would also like to take this opportunity to say thank you to all of our alumni who have been extremely generous with their support.
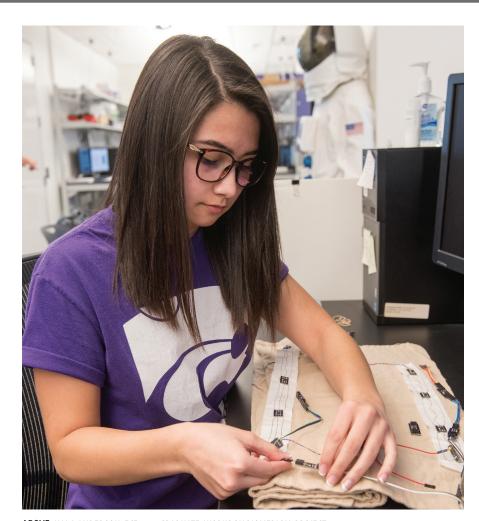
We always welcome news from our alumni, so please let us know about your recent accomplishments by sending a quick note to alumninews@ece.ksu.edu. And please feel free to stop by the department any time you are in Manhattan.

Go 'Cats!

Don M. Gruenbacher
Don M. Gruenbacher
Department Head
George J. and Alice D. Fiedler Distinguished Chair in
Electrical and Computer Engineering

ECE UPLINK

ABOVE: KALA ANDERSON, ECE 2020 GRADUATE, WORKS ON BIOMEDICAL PROJECT.
ON THE COVER: STUDENTS INTERACT AT THE 2021 SENIOR DESIGN EXPO.
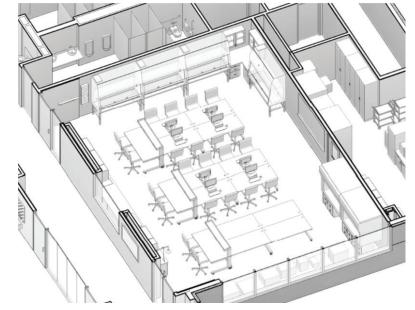
ECE UPLINK

Tong family supports biomedical education and innovation laboratory

Construction of a new teaching laboratory to support the biomedical engineering program began in spring 2021 and will be completed before the beginning of the fall 2021 semester. Made possible by a generous gift from the Peter Tong, EE '63, family, this state-of-the-art instructional facility will serve as a multipurpose laboratory where faculty can guide hands-on learning experiences related to biomedical instrumentation, tissue engineering, biomaterials, biomechanics, senior design and other subjects germane to the discipline of biomedical engineering.

The site is the previous home to a conference room and adjacent storage area on the third floor of Engineering Hall. The laboratory space is intended to serve 12-20 students per laboratory section depending on the hands-on subject matter. The biomedical engineering program was begun in the fall 2018 semester and the first graduates are expected in May 2022. The ECE department is extremely grateful to the Tong family for their support that enabled this critical project.

PLANNED FINISHED PRODUCT

BEFORE CONSTRUCTION

DURING CONSTRUCTION

NSF GRANT TO FUND STUDY OF MEASURING EMOTIONS WITH CYBERSYSTEMS

"REAL-TIME MEASUREMENT OF **VALID EMOTIONS** HAS THE POTENTIAL TO CAUSE CROSS-DISCIPLINARY **TRANSFORMATION**."

Emotions can heavily influence decision-making. To study the scope of this influence, a necessary first step is the ability to measure a person's emotional state. A project at Kansas State University has been recently funded by the National Science Foundation to develop and improve devices used for this purpose.

David Thompson, associate professor and Mark and Brenda Brown professor in electrical and computer engineering, has been awarded nearly $500,000 by the National Science Foundation's Information and Intelligent Systems: Core Programs for his project "Enhancing EEG-based Emotion Estimation with Transfer Learning, Priming and Virtual Reality."

The Information and Intelligent Systems: Core Programs is part of the NSF's Division of Information and Intelligent Systems,

which supports research and education projects that develop new knowledge in three core programs: cyber-human systems, information integration and informatics, and robust intelligence.

Thompson's project, funded under the Cyber-Human Systems Program, will lay the groundwork for devices that can be used outside the laboratory from classrooms to theme parks.

"The normal way to measure emotion is by simply asking the person, but that takes time, causes interruptions and leads to false reports," Thompson said.

His research will consist of applying three techniques — transfer learning, semantic priming and virtual reality — to increase the performance and reliability of these emotion-measuring systems. A collaboration with Thinkwell, a global entertainment company, will also be included in the project.

Together, these investigations are expected to dramatically improve the performance and, critically, the cross-task reliability of these systems.

"Emotion affects nearly every field of human study," Thompson said. "Real-time measurement of valid emotions has the potential to cause cross-disciplinary transformation."

The project will support significant undergraduate and graduate research efforts of students from all backgrounds in the Carl R. Ice College of Engineering at Kansas State University, enriching the educational experience of all participants.

WIEGERS INDUCTED INTO
2021 HALL OF FAME

During ceremonies March 5 the Carl R. Ice College of Engineering inducted Michael Wiegers as one of two new members of its Hall of Fame. Induction to the hall is the highest honor bestowed on its alumni by the college. Honorees are recognized for their professional success and accomplishment, involvement with and support of the College of Engineering, dedication to K-State, and professional and public service.

Michael Wiegers, Baldwin City, is a 1982 graduate of Kansas State University in electrical engineering. He was named to his current position, vice president, consumer engineering, Garmin International, Olathe, in 2010 and directs the strategic product and technology development of the worldwide consumer engineering group. He first joined Garmin in 1993 as the lead engineer in marine product design. During his tenure he has served in a variety of technical and business leadership capacities in all Garmin consumer product segments. Previously with King Radio, also in Olathe, he designed VHF aviation communication and navigation radios, and worked in new technology areas such as flight-critical software and electronic display systems during his 11-year career with the company.

Wiegers was named the College of Engineering 2018 Alumni Fellow at K-State and in 2019 he and his wife, Lynn, invested in the naming of the Mike Wiegers Department of Electrical and Computer Engineering in the college, empowering the department to recruit and retain top faculty, support deserving students and provide flexible funding for department leaders. Wiegers, who is originally from Marysville, served as chair of the K-State College of Engineering Advisory Council in 2020-2021 and has recently joined the advisory council for K-State Olathe.

NSF project funded for three years focuses on improved security of smart devices

Smart homes, smart infrastructure, smart health and more — the list of applications embedded with sensors, software and other technologies for the purpose of connecting and exchanging data with other devices continues to drive the need for rigorous analysis of hardware and software critical to ensuring the safety and security of these systems.
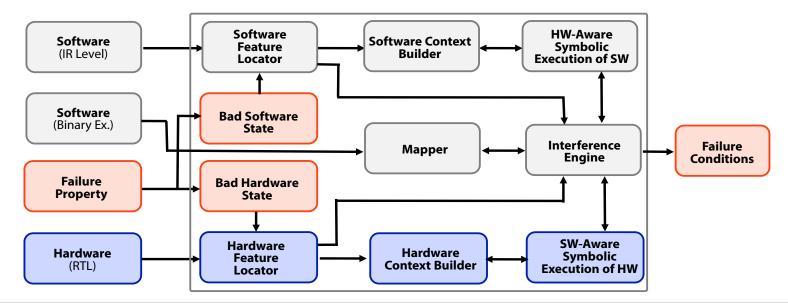
The National Science Foundation Division of Computing and Communication Foundations has awarded a $250,000, three-year grant to Xiaolong Guo, assistant professor in the Mike Wiegers Department of Electrical and Computer Engineering at Kansas State University, for further research in this area.

Guo will collaborate on the project "Property-specific Hardware-oriented Formal Verification Modules for Embedded Systems" with Tuba Yavuz, assistant professor of electrical and computer engineering at the University of Florida.

Things unique to their approach include a property-directed co-model extraction and a property-specific run-time validation process to achieve scalability and precision in detecting bugs due to hardware-software interactions.

"If successful, the research will deliver methodologies, automation tools and system-level benchmarks that will allow vendors to detect security and safety vulnerabilities in early stages," Guo said. "Its greatest impact will be on workforce training and broadening participation in formal methods and embedded-system security."

This will primarily be achieved through courses Guo will develop and teach in the Carl R. Ice College of Engineering, outreach events and collaborations with industry.

ECE department hosts Senior Design Expo

The Mike Wiegers Department of Electrical and Computer Engineering hosted its annual Senior Design Expo May 4 in the Engineering Hall atrium. A record 15 teams presented projects to faculty, staff, students and honored guests.

The senior design class receives support from industry and private donors to cover costs of project expenses. This year the class received a special donation from Roger Riggert, a 1961 graduate in electrical engineering, to provide monetary awards to the top three teams. The department also received generous support from ECE alum Don Gemaehlich and Bill Kuhn, professor emeritus, to support the design teams throughout the year.

The projects were judged on five criteria: presentation and demonstration skills; the overall quality of the design; how well the design constraints were identified; how well the project considered needs such as public health, safety and welfare, as well as global,
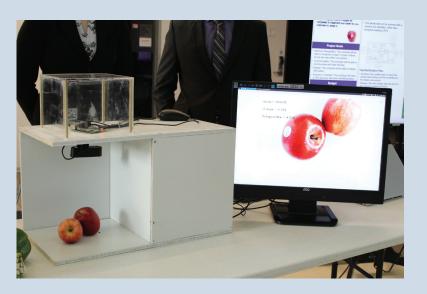
cultural, social, environmental and economic factors; and the level of teamwork demonstrated.

The first place team, WAACI, with its automatic dog-watering system, was made up of members Will Compton, Anne Bowser, Aryan Tayal, Colton Hillegeist and Ignatius Peters. Awarded second place was the automatic candle extinguisher, the project of Ahmed Al Sulais, Abdulkareem Alkhiary and Nick Koechner. Sleepy Solutions, a product designed to keep motorists alert while driving, received third place for its team members Andrew Dunn, Parker Lange, Brenden Levi and Dustin Wilson.

The winners and all of the teams are to be congratulated for their exceptional efforts.

by Rebecca S. Burks

NEW STAFF

THURLOW JOINS ECE

Ben Thurlow has joined ECE as a research technologist. Originally from Manhattan, he completed his associate's degree in electronic engineering technology at North Central Kansas Technical College in 2016. For three years he worked in the civil engineering department at K-State and before that in Wichita on aircraft test equipment. His interests are in aviation and technical work. ECE is excited to welcome him to its staff, and he is looking forward to meeting students and helping them with their project needs.
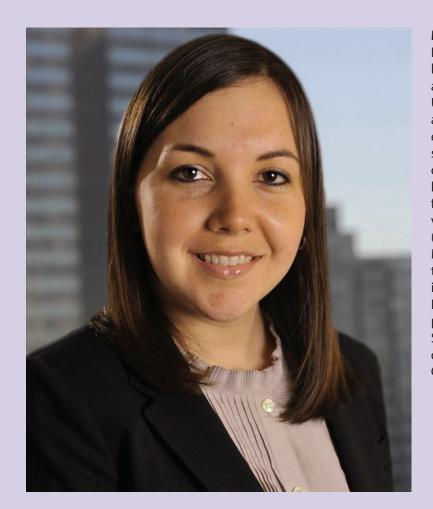
2021 PROFESSIONAL PROGRESS AWARDS

The Kansas State University Carl R. Ice College of Engineering honored 10 alumni at ceremonies March 5 for professional career accomplishment during the first 20 years following their graduation.

The following two recipients of the college's 2021 Professional Progress Award from electrical and computer engineering were nominated by Don Gruenbacher, ECE department head, and confirmed by Matt O'Keefe, dean of engineering.

Mackenzie DeWerff Martin

Mackenzie DeWerff Martin, Dallas, Texas, is a 2003 graduate of Kansas State University in electrical engineering. After completing her bachelor's degree she spent time in China learning Mandarin at Nanjing University and then went to law school at Washington University in St. Louis. Currently a partner at Baker McKenzie LLP, a large multinational law firm, she helps companies protect and enforce their intellectual property, including patents and trade secrets. She also works on cross-border intellectual property disputes and licensing matters, including the China region, and leads the firm's global patent prosecution practice. She is the chair for her firm's Dallas office diversity and inclusion committee, and volunteers with a local organization — Lake Highlands Area Moms (and More) Against Racism. She is a barrister member of the Barbara M.G. Lynn Inn of Court in Dallas, was named one of the "Lawyers on the Rise" by Texas Lawyer in 2016, earned the Rising Star Award for intellectual property at Euromoney's Americas Women in Business Law Awards in 2017, and was selected as a Rising Star for intellectual property litigation in Super Lawyers in 2017, 2018, 2019 and 2020. She has served on the electrical and computer engineering department advisory board at K-State. She is a 1999 graduate of Circle High School, Towanda, Kansas.

Mark Troutfetter

Mark Troutfetter, Austin, Texas, is a 2006 graduate of Kansas State University in computer engineering. He began his career in Austin at National Instruments, a global leader in automated test and measurement systems. Starting out in applications engineering, he moved into research and development managing various hardware and software products. He was active in recruiting at K-State for National Instruments during his tenure with the company. In 2013 he left to help found Pristine, a company focused on building software for Smart Glasses. Pristine was acquired by Upskill in Washington, D.C., in 2017, where Troutfetter served as vice president of engineering focused on bringing augmented reality to the industrial workforce. In 2020 he moved to Welltok, a total well-being-focused consumer activation company, where he currently serves as senior vice president of product development and oversees all software engineering efforts, including architecture, prioritization, execution, quality assurance, release management and general support. He is a graduate of Southeast of Saline High School, Gypsum, Kansas.
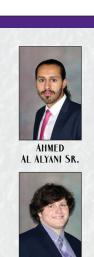
CONGRATULATIONS
2020-2021 GRADUATES

Electrical & Computer Engineering
Kansas State University
2020 - 2021

Ahmed Al Alyani Sr.
Mustafa Al Jumaan
Ahmed Al Sulais
Tarek Alsulami
Mohammed Alghamdi
Nigel Algoo Jr.
Abdulkareem Alkhiary
Moath Alshaikh
Faisal Alsuhaymi
Luis Amiel
José Avila
Branden Bearden
Blaine Bettencourt
Anne Bowser
Ben Brokesh

Nathaniel Carlston
Omar Cecenas
Christopher Chisholm
Daniel Christensen
Mark Christiansen
Meghan Clark
William Compton
Nayeline Coronilla-Guerrero
Taylor Cruse
Shivum Dang

Rebecca Debes
Jenalee Dickson
Kelcie Dinkel
Andrew Dunn
Dylan Enneking
Brittany Ferm
Leonardo Garrido
Michael Greene
Whitney Haller
Hossam Hassan

Frederick Heinecke
Colton Hillegeist
Keenan Hinton
Amy Howard
Matthew Job
Jeremy Johnson
Jack Johnson
Charles Kaifes
Cameron Kaustinen
Tony Kieffaber
Cooper King
Nicholas Koechner
Parker Lange
Brenden Levi
Yuankai Li

Ian McGhee
Jack McKenzie
Stephanie Milberger
Nolan Milleson
Jack Mravunac
Julia Munsell
Andrew Nangle
Antone Novelly
Jevin Peitzmeier
Siyuan Qiu
Connor Ridder
Andrew Rieschick
Jerome Rizzo
Jacob Schenkelberg
Alexander Sheikh

Jonah Smith
Bradly Snow
Jordan Stafford
Binyang Sun
Aryan Tayal
Cameron Thompson
Derek Thurston
David Titus
Ke Wang
Lin Yixue Watson
Dustin Wilson
Chance Yelverton
Ryan Younger

STUDENT NEWS

FACULTY NEWS

UNDERGRADUATE STUDENT AWARDS

Outstanding Student Awards

Outstanding Senior Leadership – **Stephanie Milberger**
Outstanding Senior Service – **Amy Howard**
Outstanding Senior Research – **Jenalee Dickson**

Outstanding Junior in Computer Engineering – **Caden Churchman**
Outstanding Junior in Electrical Engineering – **Patrick Flett**
Outstanding Junior in Biomedical Engineering – **Ceci Schmitz**

Outstanding Sophomore in Computer Engineering – **Bryan Hall**
Outstanding Sophomore in Electrical Engineering – **Brianna Wagoner**
Outstanding Sophomore in Biomedical Engineering – **Kharli Schiffner**

Outstanding Freshman in Computer Engineering – **Aaron Sarkar**
Outstanding Freshman in Electrical Engineering – **Carson Fair**
Outstanding Freshman in Biomedical Engineering – **Julia Helt**

Outstanding Seniors in Academic Achievement

Jose Avila
Ben Brokesh
Michael Greene
Connor Ridder

OPEN HOUSE VIDEO COMPETITION WINNERS

'Cat's Pride, Individual
1st place – **Patrick Flett**
2nd place – **Caden Churchman**

'Cat's Pride, Organization
2nd Place – **Robotics competition team**

What Makes You Unique
1st place – **Bryan Hill**

Engineer Students Having Fun
2nd place – **Anne Bowser**
3rd place – **Samuel McGowan**

Engineer Faculty/Staff Having Fun
Prof. Dave Thompson

GRADUATE STUDENT AWARDS

Graduate Teaching Award for 2019 – 2020 – **Lawryn Edmonds**
Graduate Teaching Award for 2020 – 2021 – **Dylan Wheeler**
Graduate Research Award for 2019 – 2020 – **Hazhar Karimi**
Graduate Research Award for 2020 – 2021 – **Bo Liu**
Outstanding Graduate Student for 2021 – **Qihui Yang**

WHAT HAVE YOU BEEN UP TO?

We would like to share news of our alumni in future issues of ECE Uplink.
Please send an email to alumninews@ece.k-state.edu with your latest updates and accomplishments.

Interested in supporting the Mike Wiegers Department of Electrical and Computer Engineering?

Learn more at *give.evertrue.com/ksu/ece*.

We sincerely thank you for all your generosity and support.

ECE FACULTY AWARDS

WILLIAM HAGEMAN
ASSISTANT PROFESSOR | DANIEL AND JUDI BURK CORNERSTONE TEACHING SCHOLAR | *DEAN'S AWARD OF EXCELLENCE – TEACHING*

BEHROOZ MIRAFZAL
PROFESSOR | MICHELLE MUNSON-SERBAN SIMU KEYSTONE RESEARCH SCHOLAR | *DEAN'S AWARD OF EXCELLENCE – SERVICE*

BALA NATARAJAN
PROFESSOR | STEVE HSU KEYSTONE RESEARCH SCHOLAR | *MYERS-ALFORD MEMORIAL TEACHING AWARD*

CATERINA SCOGLIO
PROFESSOR | STEVE HSU KEYSTONE RESEARCH SCHOLAR | *ENGINEERING DISTINGUISHED RESEARCHER AWARD*

DAVE THOMPSON
ASSOCIATE PROFESSOR | MARK AND BRENDA BROWN PROFESSORSHIP IN ELECTRICAL AND COMPUTER ENGINEERING

KANSAS STATE UNIVERSITY

ELECTRICAL ENGINEERING ADVANCEMENT FUND I23400

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