



DEPARTMENT OF  
**ELECTRICAL & COMPUTER  
ENGINEERING**



**MISSISSIPPI STATE**  
UNIVERSITY™



## ECE DEPARTMENT HEAD LETTER



The year 2022 was again an outstanding year for the department. Dr. Kurum received the National Science Foundation (NSF) Early CAREER Award. In 2022 we had five NSF CAREER awardees on the roster, the most by far than any other department within Mississippi State University. Our enrollment has been steady. Our unparalleled dedication to increasing diversity, equity and inclusion has increased retention rates, and we graduated the largest class of 110 students in 2022.

The department continued its efforts in recognizing excellence through internal awards at all levels: students, staff and faculty. The departmental success was carried forward to the college and university-level awards.

The Charles Hudnall ECE Makerspace continues to be a popular space, and we will have the SEL Power System Protection Laboratory available for our students in the fall. I am grateful to our very own Mike Collum, who shepherded the SEL initiative and continues to support it. He certainly has ambitious plans for the laboratory.

The 2022 “ECE Wall of Fame” inductees were an outstanding group of ECE alums: Van M. Wardlaw (Tennessee Valley Authority); James L. Flanagan (Rutgers University); and Harold R. Moore (Westinghouse Electric Corporation).

The 2022 “ECE Distinguished Alumni” awardees were equally outstanding, namely: Everette T. Beers (USDA); James B. Nail (MS State University); Jeanette H. Russ (Union University); Eric B. Welch (Christian Brothers University); Anthony L. Wilson (MS Power).

I firmly believe that our ECE Department can only succeed if our alumni are successful. The latest addition to Simrall Hall is the scholarship plaques honoring the ECE students – is your name on one of the plaques? Come and find out, and share your experiences with our current students, staff and faculty.

I am sure you will enjoy reading about these in our annual report.

### Hail State!

Samee U. Khan, Ph.D.

*ECE Department Head, Professor, and James Worth Bagley Chair*

## DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING ADVISORY BOARD

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**NICOLAS YOUNAN**, MSU – Retired ECE Department Head

# ECE BY THE NUMBERS\*

154



111

JOURNAL ARTICLES  
PUBLISHED BY FACULTY

CONFERENCE PAPERS  
PRESENTED BY FACULTY



OVER  
700

Undergraduate and  
Graduate Students



27 FACULTY  
Members including  
7 ENDOWED  
PROFESSORS



110  
UNDERGRADUATE  
DEGREES AWARDED



86 CO-OP  
STUDENTS  
in Fall 2022 and Spring 2023

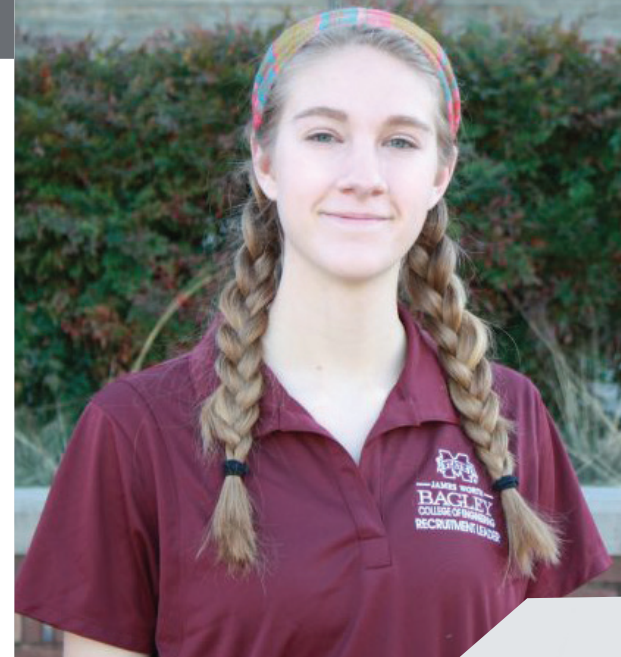


125 @ 4.0  
Fall ECE Students

Approximately  
100 PH.D.  
STUDENTS



\*2022 DATA



## STUDENT SPOTLIGHT AVRI O'DANIEL

MAJOR: Electrical Engineering

CLASSIFICATION: Junior

HOMETOWN: Jackson, MO

INVOLVEMENT:

- President, Women in Electrical and Computer Engineering
- Society of Women Engineers
- High Voltage Research
- US Soccer Referee

### WHAT IS YOUR FAVORITE CLASS AND WHY?

My favorite class that I am currently taking is probably Electronics I. It is pretty amazing to learn about how the different active elements like diodes and transistors work on the material level.

### WHAT IS YOUR FAVORITE PART ABOUT MSU?

My favorite part about MSU is ... everything. I love this school, the campus and the people. The campus is gorgeous, and you'll never meet nicer, kinder people.

### WHAT IS YOUR FAVORITE PART ABOUT ECE?

My favorite part of ECE is the hands-on learning. At Mississippi State, you can dive right into your first semester working with soldering, coding and creating circuits with Arduinos.

## CONNECT WITH US



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ECE AT MISSISSIPPI STATE UNIVERSITY



WWW.ECE.MSSTATE.EDU

## VISIT US

406 Hardy Road, 216 Simrall Hall  
Mississippi State, MS 39762





## ECE ON THE COAST

The Department of Electrical and Computer Engineering (ECE) continues to offer its electrical engineering degree through the Bagley College of Engineering's Engineering on the Coast (EOC) as an affordable and convenient option for students on the Mississippi Gulf Coast.

ECE Assistant Clinical Professor Umar Iqbal teaches a wide range of classes for EoC, and he brings the same high-quality instruction and hands-on experience that students expect from ECE—just on a different campus.

“The Engineering on the Coast program at MSU offers Gulf Coast students an affordable option for earning a world-renowned education close to home,” Iqbal said. “MSU’s hands-on curriculum includes laboratory experiences in designing, prototyping, and testing several electronics and control systems”

EoC Program Coordinator Deena Kuntz noted the program has many benefits for the local students, including cost savings, small class sizes and local industry opportunities. In addition to ECE’s two full-time professors, local industry engineers with advanced degrees instruct students in the program, which is a benefit for added depth and understanding in current trends. The location of the campus is also convenient for those who are pursuing their degree part-time.

“The Gulf Coast Campus has allowed

more electrical engineering students to attend school,” Kuntz said. “With most of the EE schedule being offered with evening hours, more students can hold a job while attending college.”

Students may complete up to 64 hours of coursework at any community college or other institution of their choice before enrolling in programs in EoC, which is a benefit for many students looking to earn their degrees.

“As a 2+2 program, the first two years of curriculum is taken at the community college, so the cost is cheaper. If the student is local to our area, the student gets by without extra housing cost during the junior and senior year. This also helps the student’s education budget,” Kuntz added.

Iqbal says the Gulf Coast classes allow for active student engagement with students from a wide range of experiences, which is why he enjoys teaching them.

“As a teacher, I enjoy guiding my EoC students with diverse backgrounds and helping them to develop a vision,” he added. “My objective while teaching is to develop professionals with excellent communication and decision-making skills.”

More information on Engineering on the Coast may be found at [www.bagley.msstate.edu/coast](http://www.bagley.msstate.edu/coast). ●



Dr. Umar Iqbal



Dr. James Fowler



Dr. Yaroslav Koshka

## TWO ECE FACULTY MEMBERS SERVING NSF ROLES

Two Mississippi State University Department of Electrical and Computer Engineering (ECE) professors are currently serving assignments with the National Science Foundation (NSF).

Professor

James E. Fowler is on an Intergovernmental Personnel Act (IPA) assignment as a program director for the Communication and Information Foundations (CIF) program within the Computing and Communication Foundations (CCF) division of the Computer

and Information Science and Engineering (CISE) directorate.

Fowler said, “Being an NSF program director offers a unique opportunity to collaborate with others while surveying the entire breadth of both domestic and international STEM research and education.”

Professor Yaroslav Koshka is program director with the Electronic and Photonic Materials program in the Division of Materials Research, Directorate for Mathematical and Physical Sciences.

Koshka said, “I was very excited about being offered this position. It is an opportunity to bring together very different parts of my cross-disciplinary research background and pay more attention to certain research areas, such as materials and hardware side of quantum computing and quantum information sciences.” ●



## KURUM RECEIVES NSF CAREER AWARD TO STUDY MICROWAVE REMOTE SENSING

A faculty member in Mississippi State's Bagley College of Engineering has earned one of the top educational honors from the National Science Foundation.

Mehmet Kurum, an assistant professor of electrical and computer engineering, is MSU's latest recipient of the prestigious Faculty Early Career Development (CAREER) award from the NSF. Kurum earned a \$500,000 grant from the NSF to study microwave remote sensing methods in the agriculture industry.

Kurum's research focuses on changing the paradigm of remote sensing methods and developing next generation technologies and ideas that are more spectrum efficient, more effective and meet the challenges of present and future radio spectrum congestion. Currently, Kurum is researching spectrum recycling in the application of precision agriculture.

"Precision agriculture most commonly

makes use of sensors like multispectral cameras, thermal or lidar. In this project, we hope to push the current paradigm for precision agriculture towards radio spectrum," Kurum said. "With a little work and some engineering, we hope to use low-cost drones and smartphones to monitor soil and crop health for farms across the world."

Kurum said he is very fortunate to work with a highly talented group of both graduate and undergraduate students at Mississippi State and is thankful to be honored by the National Science Foundation.

"I'm honored and excited to have been selected as a recipient for the NSF's prestigious CAREER program. This opportunity will further establish our group at Mississippi State University as leading researchers in the field of radio spectrum recycling in the applications of precision agriculture, forestry, water conservation and much more," Kurum said. "MSU is perfect for conducting applied research due to its stance as a land-grant university with many research centers such as the Center for Advanced Vehicular Systems (CAVS) and Geosystems Research Institute (GRI). The people, infrastructure and land available at these centers were



invaluable resources for me to collect preliminary data and develop this proof-of-concept in the field."

Kurum joins a list of recent Department of Electrical and Computer Engineering faculty members who have earned the CAREER Award. Recent recipients include Yong Fu, Ali Gurbuz, Jean Mohammadi-Aragh and Bo Tang. ●

## ECE'S ELECTRICAL ENGINEERING BACHELOR'S DEGREE NOW AVAILABLE ONLINE

ECE's bachelor's degree in electrical engineering is now available from almost anywhere in the world, all thanks to the new online degree program that started in Fall 2022.

"This is an exciting opportunity and opens our online outreach to a new group of individuals," Tamra Swann, distance education coordinator for the Bagley College of Engineering, said.

Swann said the new online degree provides options for students who might not be able to come to campus to complete their bachelor's degree or for students who had to leave campus early for personal or professional reasons. She added online students experience the

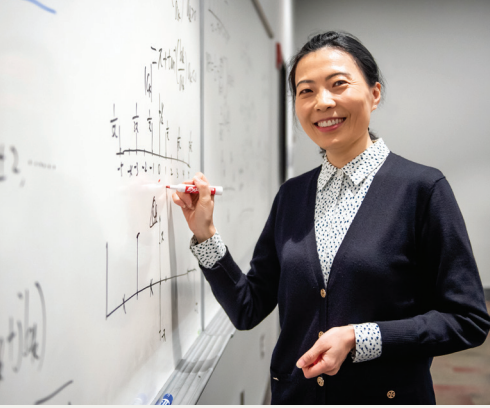
same level of rigor and complete their classes and degree with the same level of knowledge as any on campus.

"The new electrical engineering online degree program is a testament to the ever-changing land-grant mission," Samee Khan, department head for electrical and computer engineering said. "I believe that the department, its faculty and staff are 100% ready and committed to providing the quality education that has been the staple of the electrical and computer engineering department for over a century to our online undergraduate students."

Students who enroll in the 128-credit hour electrical engineering undergraduate program complete the same curriculum as the department's face-to-face students, including the project-based design courses. For more information about ECE's online programs, visit [www.online.msstate.edu](http://www.online.msstate.edu). ●







Dr. Qian "Jenny" Du, ECE Graduate Program Coordinator and Professor

## ECE PROFESSOR LISTED AMONG MOST CITED RESEARCHERS IN THE WORLD

An electrical engineering professor has been recognized among the most-cited researchers in the world in the field of geosciences.

Qian "Jenny" Du, the Bobby Shackouls Endowed Professor in the university's Department of Electrical and Computer Engineering, is one of two MSU professors recognized as a "Highly Cited Researcher" in Clarivate Analytics' 2022 Web of Science citation index. Du is listed among 6,938 scientists and social scientists around the world whose papers rank in the top 1% of citations for a field and publication year.

Du, a top-cited researcher in geosciences, has been referenced approximately 10,415 times. An MSU faculty member since 2004, she has research interests in digital image processing, remote sensing, data compression, neural networks and superresolution. Du has served as an editor for several respected journals and has over 300 journal publications, among other published works. She received bachelor's and master's degrees from the Beijing Institute of Technology, as well as master's and doctoral degrees from the University of Maryland, Baltimore County, all in electrical engineering. ●

## ECE GRADUATE STUDENT AWARDEES

### 2021-2022 ECE Graduate Awardee:

Aly Abdalla  
(Major Professor: Vuk Marojevic)

### 2022-2023 ECE Graduate Awardees:

Md Khurshedul Islam  
(Major Professor: Seungdeog Choi)  
Tingjun Lei  
(Major Professor: Chaomin Luo)

### 2022-2023 ECE Research Symposium Awardees:

Sabyasachi Biswas  
(Major Professor: Ali Gurbuz)  
Tingjun Lei  
(Major Professor: Chaomin Luo)

## SPRING 2022

### MS THESES:

STUDENT: BENJAMIN BARTLETT  
Major Professor: Ali Gurbuz  
Title: Recognizing Traffic Signaling Gestures Through Automotive Sensors

STUDENT: MATTHEW DUCK  
Major Professor: Ali Gurbuz  
Title: Analysis and Implementation of Low Fidelity Radar-based Remote Sensing for Unmanned Aircraft Systems

STUDENT: JONAH GANDY  
Major Professor: John Ball  
Title: Adaptive Cruise Control with Vehicle to Infrastructure Communication

STUDENT: YADUNANDAN PAUDEL  
Major Professor: Yong Fu  
Title: Transformer Fault Event Detection and Classification Using PMUs

STUDENT: WILLIAM WOO  
Major Professor: John Ball  
Title: A Harmonic Radar System for Honey Bee Tracking to Better Understand Colony Collapse Disorder

**NON-THESIS MS:** SAMUEL MCDEVITT, BRIAN REMOND, ZACHARY WARREN, WESLEY YARBER

### PHD DISSERTATIONS:

STUDENT: ROBIULHOSSAIN MDRAFI  
Major Professor: Ali Gurbuz  
Title: Data-Driven Sparse Computational Imaging with Deep Learning

STUDENT: SUVASH SHARMA  
Major Professor: Bo Tang  
Title: Performance Enhancement of Wide-Range Perception Issues for Autonomous Vehicles

STUDENT: CHIRANJIBI SHAH  
Major Professor: Jenny Du  
Title: Spatial-spectral Analysis in Dimensionality Reduction for Hyperspectral Image Classification

## SUMMER 2022

### MS THESIS:

STUDENT: JASON FARMER  
Major Professor: Bo Tang  
Title: Development of the Subwave ROV and Neural-Inertial Positioning System

### PHD DISSERTATIONS:

STUDENT: FARHINA HAQUE  
Major Professor: Chanyeop Park  
Title: Modeling Supercritical Fluids and Fabricating Electret Films to Address Dielectric Challenges in High-Power-Density Systems

STUDENT: SUJAN POU DYAL  
Major Professor: Jean Mohammadi-Aragh  
Title: Case Study of Using Hybrid Model Machine Learning Techniques in Educational Data Mining to Improve the Classification Accuracies

STUDENT: CHENXU ZHANG  
Major Professor: Yong Fu  
Title: Short-term Electricity Price Point and Probabilistic Forecasts

## FALL 2022

### MS THESIS:

STUDENT: WILLIAM JOHNSON  
Major Professor: Ali Gurbuz  
Title: Assessment of Simulated and Real-World Autonomy Performance with Small-Scale Unmanned Ground Vehicles

**NON-THESIS MS:** TODD PIERCE

### PHD DISSERTATIONS:

STUDENT: SEYED SAEED MIRAEI-ASHTIANI  
Major Professor: Masoud Karimi  
Title: Resiliency of Levee-protected Power Networks to Flooding in a Changing Climate, Integrating Environmental Justice

STUDENT: JOHN HUTTON  
Major Professor: Jean Mohammadi-Aragh  
Title: Comparing Importance of Knowledge and Professional Skill Areas for Engineering Programming Utilizing a Two Group Delphi Survey





## DAMIR NOVOSEL RECOGNIZED FOR SERVICE

Damir Novosel, an ECE alumnus with over forty years in the industry, was recently recognized with IEEE Power & Energy Society's Patrick P. Ryan Meritorious Service Award.

The award, which recognizes contributions in leadership, global inclusion, membership growth and technical and leadership activities, recognizes Novosel's continued impact.

"I am very honored to receive this recognition, especially since it comes from my peers. My peers taught me that working together with your colleagues makes you more successful and that sharing credit with your colleagues makes you stronger," Novosel said.

Novosel has served IEEE Power & Energy Society (PES) in many leadership roles, including President, Chair of the Technical Council and Vice President of Technical Activities. He also facilitated industry engagement at global conferences, formed the IEEE PES Industry Technical Support Leadership Committee and established the successful

PES Corporate Engagement Program.

Novosel acknowledges mentors from Mississippi State for their direction, notably Drs. Roger King and Stan Grzybowski.

"I am grateful for their comradery and guidance and hope that I am continuing to set the good example they did for me for the next generation," he said. "As a student, I realized that one can accomplish much more by working with colleagues. For example, my mentor at Mississippi State University, Dr. Roger King, encouraged his students to share our research results that helped us to be more innovative and efficient."

Novosel said the electrical power industry has an important role in achieving a clean environment and affordable electricity and noted the numerous opportunities, encouraging current ECE students to collaborate.

"My definition of teamwork, which is wanting and helping your colleagues to succeed, has been a guiding principle in my career and has helped my colleagues and me build industry leading teams. As we are all different, it is important to value various sets of skills, experiences and methods," he said.

In addition to the IEEE PES service, other accomplishments include being an IEEE Fellow, being elected to the National Academy of Engineers and membership with the CIGRE US National Committee. Novosel has 18 U.S. and international patents, over 200 articles and reports and has contributed to seven books.

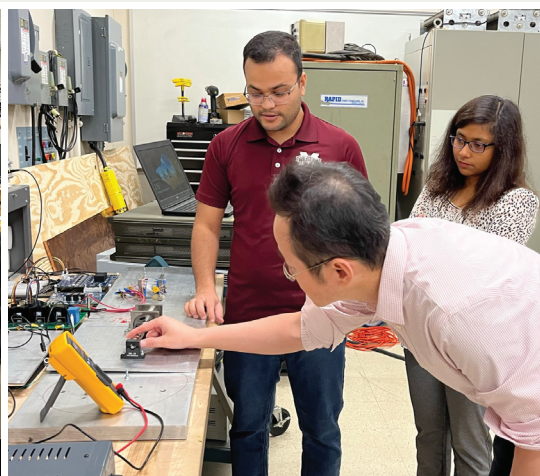
Novosel earned his bachelor's degree from the University of Tuzla and his master's degree from the University of Zagreb. He holds his Ph.D. degree in electrical engineering from Mississippi State University and was a Fulbright scholar. ●

## ECE OPENS STUDENT SUCCESS CENTER

The ECE Student Success Center opened its doors on the first floor of Simrall Hall in 2022 to provide a dedicated space for the department's students.

The center serves as a central location for the computer engineering and electrical engineering advisors so students can attend appointments and utilize the walk-in advising hours. In addition to housing the advisors, the center is used for student success events. In the first year, events included 4.0 GPA celebrations, first-year advising check-in meetings and curriculum question & answer sessions. These events target students' academic needs. It is also the location for the program's Faculty Professional Interview Sessions, which are held as part of the department's curriculum and professional development discussions. Additionally, the ECE Student Success Center has expanded into hosting industry meet-and-greets, experiential learning sessions and ECE student groups. Students have quickly learned it is a hub for all student content, especially with the television rolling through academic reminders, ECE event announcements, student spotlights and award winners.

The location has become a stop for prospective students as well. It has become a popular location to visit as part of campus tours and during recruitment, and ECE is able to highlight its commitment to student success. Incoming students are able to see what MSU, the Bagley College of Engineering and ECE have to offer. ●







MISSISSIPPI STATE UNIVERSITY™  
JAMES WORTH  
**BAGLEY**  
COLLEGE OF ENGINEERING

Department of Electrical and Computer Engineering  
P.O. Box 9571  
Mississippi State, MS 39762



## **MAKE AN IMPACT**

Through the generosity of alumni and donors, the Department of Electrical and Computer Engineering (ECE) continues to grow its legacy in the James W. Bagley College of Engineering. The generosity of those who give is influencing the next generation of leaders. Individuals wishing to invest have many opportunities, including scholarships, endowments, named awards, and facility enhancements. Please visit <https://www.ece.msstate.edu/giving/> or contact us directly to discuss the impact that you can make on the department and its students:

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