April 20, 2018

Thank you for joining us at the Spring 2018 Fulton Undergraduate Research Initiative, or FURI, Symposium. Research and innovation are a core focus of the Fulton Schools community, from first-year students through advanced doctoral students and faculty. Together, students and faculty collaborate across disciplines to conduct important research that addresses real-world challenges in education, energy, health, security and sustainability.

Four of our signature programs enhance students’ engineering and technology education through hands-on research in the labs of our renowned faculty. Students involved in these programs are invited to present their research at the FURI Symposium.

FURI exposes undergraduate students to the research enterprise — from conceptualizing an idea, developing a plan and investigating the research question to presenting their research outcomes. The Master’s Opportunity for Research in Engineering, or MORE, program provides the same experience for our master’s students. Both programs develop and hone skills that will serve students well in their future pursuits and careers: the ability to innovate, think independently, solve problems and defend their findings.

The entrepreneurial mindset also has a place in research. Our Kern Family Foundation project funds student research that emphasizes entrepreneurial thinking, with a specific focus on highlighting connections and creating value.

In our Grand Challenge Scholars Program, also known as GCSP, students conduct research in one of 14 grand challenge themes set forth by the National Academy of Engineering. Research is one part of their five-part program that additionally challenges them to explore interdisciplinary coursework, gain a global perspective, engage in entrepreneurship and give back to the community through service learning.

These influential programs also provide our students with opportunities beyond the research experience in the laboratory. Undergraduate students can travel to prestigious conferences to present their work — an activity often only available to graduate students. Doors also open to scholarships, internships and further research in graduate school and more.

As you browse the poster session today, be sure to talk with our students about their research. We are proud of what they’ve accomplished and we’re excited to share their work with you.

Sincerely,

Kyle D. Squires, PhD
Dean, Ira A. Fulton Schools of Engineering
Professor, Mechanical and Aerospace Engineering

Kae Sawyer
Associate Director
Student Engagement

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On the cover

YiZhuang “JJ” Garrard
ASU Kern Project KEEN supported FURI student researcher | Graduation: May 2019 | Hometown: Tokyo, Japan

Cost-Effective Surveying Using Multiple Unmanned Aerial Vehicles

Mentor: Wenlong Zhang, assistant professor

This project focuses on taking advantage of the low cost and ease of use of quadcopters for performing topological surveys via an unmanned aerial system (UAS) that will autonomously task a fleet of unmanned aerial vehicles (UAVs) to partition and survey a user-designated land area. The researcher has bilateral communication between a quadcopter and an Android tablet that lets the user monitor the status of a quadcopter and send simple commands and missions to the quadcopter. This project is an opportunity for the researcher to develop their technical skills in addition to using the Entrepreneurial Mindset outside of the classroom.
**Snapshot Spring 2018**

**FURI**
- Mentors: 94
- Students: 155

**FURI Majors**
- Aeronautical Management Technology (UAS): 1
- Aerospace Engineering (Aeronautics): 4
- Aerospace Engineering (Astronautics): 3
- Biomedical Engineering: 24
- Chemical Engineering: 22
- Civil Engineering: 2
- Civil Engineering (Environmental Engineering): 3
- Computer Science: 15
- Computer Science (Information Assurance): 1
- Computer Science (Software Engineering): 1
- Computer Systems Engineering: 5
- Electrical Engineering: 15
- Engineering (Automotive Systems): 2
- Engineering (Electrical Systems): 2
- Engineering (Mechanical Engineering Systems): 1
- Engineering (Robotics): 8
- Engineering Management: 1
- Environmental Engineering: 1
- Environmental Resource Management: 1
- Industrial Engineering: 5
- Materials Science and Engineering: 7
- Mechanical Engineering (Computational Mechanics): 2
- Mechanical Engineering (Energy/Environment): 1
- Mechanical Engineering: 25
- Software Engineering: 3

**MORE**
- Mentors: 28
- Students: 33

**MORE Majors**
- Biomedical Engineering MS: 6
- Chemical Engineering MS: 5
- Civil/Environmental/Sustainable Engineering MS: 3
- Computer Engineering (Computer Systems) MS: 1
- Computer Engineering (Electrical Engineering) MS: 1
- Computer Science MCS: 1
- Computer Science MS: 2
- Electrical Engineering MS: 4
- Electrical Engineering MSE: 1
- Engineering MS: 1
- Industrial Engineering MS: 2
- Mechanical Engineering MS: 6

“Involve as many disciplines as you can in your research. Innovation grows on a foundation of interdisciplinary research.”

— Ramesh Tadayon
FURI Spring ’15
Biomedical Engineering ’16
Graduate Student, ASU

**FURI**
The Fulton Undergraduate Research Initiative is a signature Fulton Schools program for undergraduate students to conduct research, work in the lab and travel to conferences.

**MORE**
The Master’s Opportunity for Research in Engineering program augments graduate students’ engineering education with research and lab experience.
Research opportunities

Fulton Undergraduate Research Initiative (FURI)
The Fulton Undergraduate Research Initiative enhances an undergraduate student’s engineering experience and technical education by providing hands-on lab experience, independent and thesis-based research and travel to national conferences.

Master’s Opportunity for Research in Engineering (MORE)
The Master’s Opportunity for Research in Engineering is designed to enrich a graduate student’s engineering and technical graduate curriculum with hands-on lab experience, independent and thesis-based research.

ASU Kern Project grants and KEEN support
ASU Kern Project grant recipients and KEEN-supported FURI students receive funding to support research, projects or travel that exemplifies an entrepreneurial-minded approach. Funded student researchers apply curiosity and connections to create extraordinary value for stakeholders and present their research at the FURI Symposium.

Grand Challenge Scholars Program (GCSP)
The Fulton Schools Grand Challenge Scholars Program combines innovative curriculum and cutting-edge research experiences into an intellectual fusion that spans academic disciplines and includes entrepreneurial, global and service learning opportunities. Students in the Grand Challenge Scholars Program conduct research in a grand challenge theme and are invited to present their research at the FURI Symposium.
How do you get started?

“Start early, get involved and pick a topic that you are excited about!”

— Carly Thalman
FURI Summer ’16–Fall ’16
Engineering (Robotics) ’16
Graduate Student, ASU; Intern, Raytheon

Step 1: Develop your research interests.
Step 2: Identify possible research mentors.
Step 3: Prepare to talk with faculty.
Step 4: Contact faculty members.
Step 5: Make a decision.
Step 6: Take the free FURI orientation on Blackboard.

What you’ll learn from FURI orientation:
• Understand how to create research questions.
• Conduct literature reviews.
• Maximize library resources.
• Make undergraduate research a reality for you.

Students who take the course will get a #FURIous t-shirt!

For more information, visit
links.asu.edu/undergrad-research

Contact the Fulton Undergraduate Research Initiative office at furi@asu.edu with questions or if you need advice on next steps.

Find research opportunities at
links.asu.edu/
FURI-research

Find out more about the research presented at this semester’s FURI Symposium
furi.engineering.asu.edu
To develop plans and operate autonomously, robots need knowledge bases encoded in PDDL, the planning domain definition language. The purpose of this research is to explore learning methods to reduce the human supervision needed to acquire these knowledge bases. A reinforcement learning environment was developed to allow a learning agent to explore the meta-space of all possible knowledge bases. A reward signal based on a problem set evaluation method was created to aid the agent in learning a correct model. Further research will explore the use of heuristics and generalizations to improve the agent's learning outcomes.
Education

Society needs more engineers. We are engaged in advancing the ways we educate engineering students. The Fulton Schools’ research focuses on learning methods, cognitive theory and best teaching practices, as well as the integration of engineering concepts in K-12 educational programs to engage students early and educate our community about the impact that engineering has on everyday life.

FURI student researchers

Anas Arafat ’18
Industrial Engineering
Hometown: Al-Hudaydah, Yemen
Student Retention
Mentor: Linda Chattin, principal lecturer

Austin Armstrong ’19
Engineering (Robotics)
Hometown: Phoenix, Arizona
Camera Positional Robotic Arm
Mentor: Angela Sodemann, assistant professor

Alireza Bahremand ’18
Software Engineering
Hometown: Detroit, Michigan
Inside-Out Tracking with Redirected Walking for Free World Mobile Virtual Reality Navigation
Mentor: Robert LiKamWa, assistant professor

Andrew Carlson ’19
Engineering (Robotica)
Hometown: Chandler, Arizona
Low-Cost Sensing
Mentor: Daniel Aukes, assistant professor

Diana Chen ’19
Computer Science
Hometown: Darien, Illinois
Enhancing Interdisciplinary Thinking in Co-Curricular Programs
Mentors: Tirupalavanam Ganesh, associate research professor, and Amy Trowbridge, senior lecturer

Ryan Christensen ’19
Computer Science
Hometown: Chandler, Arizona
Learning Modes for Sequential Decision Making Using Stochastic Search
Mentor: Siddharth Srivastava, assistant professor

Carolyn Christie ’18
Electrical Engineering
Hometown: Scottsdale, Arizona
Design and Development of a Precision Robotic Thrower and a Smart Target
Mentor: Armando Rodriguez, professor

Galen Kingsley ’18
Aerospace Engineering
Hometown: Mesa, Arizona
Aerodynamics of Propulsion
Mentor: Timothy Takahashi, professor of practice

Caroline Kireopoulos ’20
Mechanical Engineering
Hometown: Scottsdale, Arizona
Service Learning and Retention in Undergraduate Engineering
Mentor: Stephanie Gillespie, lecturer

Corey Kurowski ’19
Electrical Engineering
Hometown: Tolleson, Arizona
Image Processing and Tracking in Underwater Low-Light Conditions
Mentor: Armando Rodriguez, professor

James Larson ’18
Engineering (Electrical Systems)
Hometown: Incline Village, Nevada
Adaptive Expertise in Embedded Systems Design
Mentors: Shawn Jordan, associate professor, and Micah Lande, assistant professor

Kevin Lough ’19
Computer Science
Hometown: Flagstaff, Arizona
Enumeration of Self-Avoiding Walks in Self-Organizing Particle Systems
Mentor: Andrea Richa, professor

Diego Perozo ’18
Industrial Engineering
Hometown: Caracas, Venezuela
Student Retention Analysis
Mentor: Linda Chattin, principal lecturer

Ashley Satkowski ’19
Computer Science
Hometown: Okinawa, Japan
Spatiotemporal Framework for Dynamic Merged Reality Contant Creation
Mentor: Robert LiKamWa, assistant professor

Aashiq Shaik ’20
Computer Science
Hometown: Cupertino, California
Using Prefetching Algorithms to Seamlessly Download Data
Mentor: Robert LiKamWa, assistant professor

Kyle Shumway ’22
Computer Science
Hometown: Tempe, Arizona
Reinforcement Learning with Randomized Rewards
Mentor: Troy McDaniel, assistant research professor

Jonacarl Vilchez ’20
Computer Science
Hometown: Los Angeles, California
The Use of Augmented Reality (AR) and Physical Activity (PA) to Help Students with ADHD Learn
Mentor: Troy McDaniel, assistant research professor

Trie Waggoner ’18
Computer Science
Hometown: Tempe, Arizona
Mentor: Armando Rodriguez, professor

ASU Kern Project KEEN supported students

Alex Bertram ’20
Electrical Engineering
Hometown: New York, New York
NASA Space Grant Robotics
Mentor: Ryan Meuth, lecturer

Lemlem Brook ’18
Biomedical Engineering
Hometown: Phoenix, Arizona
National Association of Engineering Student Councils Engineering Leadership Summit
Mentor: James Colloffello, professor

Ryan Fagan ’19
Aerospace Engineering
Hometown: Peoria, Arizona
Handheld IR Spectrometer
Mentor: Phil Christensen, professor

Jacob Knaup ’19
Engineering (Robotics)
Hometown: Queen Creek, Arizona
Developing an Educational Robotic Platform
Mentor: Daniel Aukes, assistant professor

Jun Sasaki ’19
Engineering (Mechanical Engineering Systems)
Hometown: Wailuku, Hawaii
Society of Automotive Engineering Baja Competition
Mentor: James Contes, senior lecturer

Brent Wallace ’20
Electrical Engineering
Hometown: Phoenix, Arizona
2018 Spaceport America Cup
Mentor: Anoop Grewal, lecturer

GCSP student researcher

Kiana Ghazouli ’18
Computer Science
Hometown: Redwood City, California
Impact of Time Constraints on HackerRank Assessments
Mentor: Robert Atkinson, associate professor

MORE student researchers

Siddhart Prakash ’18
Computer Science
Hometown: Bhagalpur, Bihar, India
Real-time Illumination Estimation for Mobile Augmented Reality
Mentor: Robert LiKamWa, assistant professor

Ragini Sistla ’18
Computer Science
Hometown: Hyderabad, Telangana, India
Are Existing Knowledge Transfer Techniques Effective to Train Deep Networks On Edge Devices?
Mentor: Ming Zhao, associate professor

“Doing research on a subject outside of my major helped me keep an open mind about the different opportunities in engineering.”

— Isaias Martinez

FURI Spring ’13 Aerospace Engineering ’14
Mechanical Engineer, Raytheon
Porous Silica Films as Thermally Insulating Coatings on Windows

Mentor: Zachary Holman, assistant professor

The deposition of transparent, porous silica films as thermally insulating coatings on windows will help reduce energy costs in buildings and homes. Ninety percent porous silica has been characterized by its thermal and optical properties showing surprisingly low conductivities compared to estimates. Film adhesion, stress and transparency have shown to be major hurdles during the development of these coatings and will be the focus of future work.
Energy

The urgency to discover and deploy new forms of carbon-reducing energy technologies has become an indispensable part of our economic and environmental landscape. The Fulton Schools’ research in renewable and alternative energy sources is multifaceted with efforts in solar and photovoltaic energy, biotechnology, low- and high-power energy storage, power electronics, electric power systems, batteries and hydrogen fuel cells.

Mark Kapron '19
Electrical Engineering
Hometown: Chandler, Arizona
Suns-VOC Measurements of Semi-Transparent Perovskite Solar Cells
Mentor: Zachary Holman, assistant professor

Kyle Kingston '18
Engineering Management
Hometown: Mesa, Arizona
Centrifugal Compressor with Thrust Vector Control for UAV Propulsion
Mentor: Mary Nienczyk, associate professor

Sara Lee '19
Chemical Engineering
Hometown: Gilbert, Arizona
Enhancing Inorganic Carbon Absorption and Fixation by Cyanobacteria using Amine Absorbsents
Mentor: David Nielsen, associate professor

Leo Lin '19
Mechanical Engineering
Hometown: Chandler, Arizona
The Effects of Shear Modulus on Fouling Rates
Mentor: Konrad Rykaczewski, assistant professor

Nikki Lopez '19
Mechanical Engineering
Hometown: Glendale, Arizona
Development of a Ground Robot with a Simultaneous Localization and Mapping (SLAM) Capability
Mentor: Armando Rodriguez, professor

Trevor Lucero '19
Mechanical Engineering Systems
Hometown: Lakewood, Colorado
Optimizing Control Strategies for Hybrid Electric Vehicles to Reduce Fuel Consumption and Idling Times
Mentor: Abdel Mayyas, assistant professor

Karim Mardambek '19
Civil Engineering
Hometown: Gilbert, Arizona
Fracture Toughness vs. Salt Content of Ice
Mentor: Christian Hoover, assistant professor

Miles Miller '18
Engineering (Automotive Systems)
Hometown: Ramona, California
CoP Fleet Performance and Environmental Impact Evaluation
Mentor: Jeffrey Wishart, clinical assistant professor

Philip Mulford '19
Aerospace Engineering
Hometown: Warrenton, Virginia
Viability Study for a 2-Degree-of-Freedom Canfield Joint for Spacecraft Attitude Control Application
Mentor: Daniel White, lecturer

Corbin Ott '18
Electrical Engineering
Hometown: Indianapolis, Indiana
Perovskite Surface Analysis
Mentor: Zachary Holman, assistant professor

Neil Rastogi '19
Chemical Engineering
Hometown: Chandler, Arizona
Selective Electro-Fermentation of Scenedesmus Acutus
Mentor: Bruce Rittmann, professor

Thembelihle Shongwe '18
Chemical Engineering
Hometown: Manzini, Swaziland
Converting Industrial Combustion Byproducts to Liquid Transportation Fuels and Environmentally Friendly Nitrogen-containing Compounds
Mentor: Jean Andino, assistant professor

Andrew Swedler '18
Chemical Engineering
Hometown: Scottsdale, Arizona
Convective Heat Transfer in a Rotary Drum
Mentor: Heather Emady, assistant professor

William Frieden Templeton '18
Chemical Engineering
Hometown: Scottsdale, Arizona
Effects of Plasticizers on Solid Rocket Propellant Adhesion
Mentor: Matthew Green, assistant professor

Nicholas Theut '19
Chemical Engineering
Hometown: Phoenix, Arizona
Development of ZnSnON as a Potential Earth Abundant Solar Cell Material
Mentor: Mariana Bertoni, assistant professor

Yida Tong '18
Mechanical Engineering
Hometown: Xiangyang, Hubei, China
Finite Element Modeling of Micro-scale Bending Testing of Nuclear Reactor Materials
Mentor: Pedro Peralta, professor

Ariana Tse '19
Materials Science and Engineering
Hometown: Tempe, Arizona
Nanoporous Morphology of Deallloyed Parent Phase Ordered and Disordered Cu3Au Alloys
Mentor: Karl Sieradzki, professor

Paulo Vasconcelos '19
Aerospace Engineering
Hometown: Recife, Pernambuco, Brazil
Using CFD Tools to Determine Aerodynamic Forces and Moments of Floating Objects in Engineering Applications
Mentor: Hui-Ping Huang, associate professor

Justin Whetten '19
Materials Science and Engineering
Hometown: Mesa, Arizona
Next-Generation Composite Polymer Solid Electrolytes
Mentor: Candace Chan, assistant professor

Daniel Coxe '18
Mechanical Engineering
Hometown: Niantic, Connecticut
Turbulent Drag Reduction in Pipes by Spanwise Wall Oscillations
Mentors: Yulia Peet, assistant professor, and Ronald Adrian, professor

Sami Mian '18
Computer Engineering (Electrical Engineering)
Hometown: Phoenix, Arizona
Development of a Battery Management and Charging System for Autonomous UAVs
Mentor: Troy McDaniel, assistant research professor

Uyen Tong '18
Chemical Engineering
Hometown: Dong Nai, Vietnam
ZIF-71/PDMS Mixed Matrix Membranes for Acetone-Butanol-Ethanol Separations by Pervaporation
Mentor: Mary Laura Lind Thomas, associate professor

Simol Shah '18
Chemical Engineering
Hometown: Mesa, Arizona
Photochemical Transformation on Plasmonic Nanoparticles Via Resonant Radiated-Induced Heating
Mentor: Maxim Sukharev, guest presenter

“A try to use your research topic as a launching point into the broader field. You never know where you might end up.”
— James Jensen

Ira A. Fulton Schools of Engineering | engineering.asu.edu
Navajo neurohepatopathy (NNH) is a fatal genetic disorder often caused by 149G>A mutation in the MPV17 gene. NNH (affecting 1-in-1,600 Navajo babies) is characterized by brain damage and liver disease/failure. Phoenix Children’s Hospital currently uses gene sequencing to identify the 149G>A mutation. While this process is conclusive, there are limitations, as it requires both time (three to four weeks) and money (more than $700). Ultimately, these factors create barriers that can directly impact a patient’s quality of life. Thus, the researchers propose using Tentacle Probe technology (TP) to develop a sensitive and specific rapid diagnostic tool for accurately detecting the 149G>A mutation.
Health

The Fulton Schools’ efforts in health innovation range from understanding the causes behind Alzheimer’s disease and improving methods for predicting epileptic seizures to developing advanced biosensors, bioassays and lab-on-a-chip devices for clinical diagnostics. Additional areas of research exist in novel biological materials, neural engineering, biomedical informatics, drug-delivery systems, health care systems analysis and modeling, health monitoring devices and human rehabilitation technologies.

Blake Browning ’19
Biomedical Engineering
Hometown: Scottsdale, Arizona
Side-Viewing Photoacoustic and Ultrasound Imaging Probe
Mentor: Barbara Smith, assistant professor

Kimberly Bui ’19
Mechanical Engineering
Hometown: Phoenix, Arizona
Developing Prosthesis for Children with Disabilities to Participate in Sports
Mentor: Armando Rodriguez, professor

Abigail Call ’20
Chemical Engineering
Hometown: Scottsdale, Arizona
Comparative Assessment of DARPin and scFv for Neurodegenerative Disease Diagnostics
Mentor: Michael Sierks, professor

Matthew Chrest ’19
Biomedical Engineering
Hometown: Murrieta, California
Photocoustic Flow Cytometry
Mentor: Barbara Smith, assistant professor

Bryce Copenhaver ’20
Engineering (Robotics)
Hometown: Tucson, Arizona
Development of an Independent Compact Air Compression System for Soft Robotic Actuation
Mentor: Panagiotis Polygerinos, assistant professor

Nguyen Dang Xuan ’18
Environmental Resource Management
Hometown: Hanoi, Vietnam
Potential Effect of Prolonged Weathering on Heavy Metal Leaching from Heavy-Metal-Treated-Wood
Mentor: Kiril Hristovski, associate professor

Samjhana Devkota ’18
Computer Science
Hometown: Glendale, Arizona
Perception of Emotions Based on Tactile Facial Action Units by Individuals Who are Blind
Mentor: Troy McDaniel, assistant research professor

Carlyne Frisch ’20
Biomedical Engineering
Hometown: Scottsdale, Arizona
Progerin-Induced Aging to Develop a Human-Induced Pluripotent Stem Cell Model of Alzheimer’s Disease
Mentor: David Brafman, assistant professor

Audre Garcia ’19
Engineering (Robotics)
Hometown: Woolwich, England
A Higher-Quality Haptic Display
Mentor: Angela Sodemann, assistant professor

Tiffany Gong ’18
Biomedical Engineering
Hometown: Mesa, Arizona
The Development of a Multi-Marker Sensor for Patients with Diabetes Mellitus
Mentor: Jeffrey La Belle, assistant professor

Smita Gopalakrishnan ’20
Biomedical Engineering
Hometown: Tempe, Arizona
Assessing the Ability of Startle to Predict Learning Retention
Mentor: Claire Honeycutt, assistant professor

Shannon Grassi ’19
Biomedical Engineering
Hometown: Gilbert, Arizona
Human Neural Progenitor Cell Transplantation Sustainment and Maturation with Immunodeficient Mice
Mentor: Sarah Stabenfeldt, associate professor, and David Brafman, assistant professor

Xianfan Gu ’18
Electrical Engineering
Hometown: Guangzhou, Guangdong, China
Energy-Free Personal Security Wristband
Mentor: Yi Ren, assistant professor

Hawley Helmbrecht ’18
Chemical Engineering
Hometown: Phoenix, Arizona
Diagnostic Methods for Detecting Microvillus Inclusion Disease
Mentor: Michael Caplan, associate professor

Joshua Hsu ’19
Biomedical Engineering
Hometown: Tempe, Arizona
Integrated Sensing for a Soft Neuroprosthetic
Mentor: Panagiotis Polygerinos, assistant professor

Zachary Humphreys ’19
Biomedical Engineering
Hometown: Corvallis, Oregon
Clinical Imaging Post-Processing to Improve Surgery in Focal Cortical Dysplasia Cases
Mentor: Vikram Kodibagkar, associate professor

Ladan Kamali Sarvestani ’18
Biomedical Engineering
Hometown: Shiraz, Iran
Quantifying Post-Surgical Brain Shift to Improve Multi-Modal Imaging Application in Surgical Treatment of Epilepsy
Mentor: Vikram Kodibagkar, associate professor

Itai Kreisler ’18
Biomedical Engineering
Hometown: Long Khanh, Vietnam
Chemical Gradient Fabrication through Electrospinning
Mentor: Julianne Holloway, assistant professor

Minh Le ’18
Chemical Engineering
Hometown: Long Khanh, Vietnam
Chemical Gradient Fabrication through Electrospinning
Mentor: Julianne Holloway, assistant professor

Lyne Lehmann ’20
Mechanical Engineering
Hometown: Phoenix, Arizona
Investigating Leg Prosthesis Kinematics for Walking on Surfaces of Different Compliance
Mentor: Panagiotis Artemiadis, associate professor

Kyle Lewis ’19
Engineering (Robotics)
Hometown: Phoenix, Arizona
Soft Robotics: A Quasi-Passive Knee Brace to Assist in Lifting
Mentor: Thomas Sugar, professor

Jinglin Liu ’18
Biomedical Engineering
Hometown: Xi’an, China
Data Process Methods in the Design of Pressure Monitoring System for Scoliosis Fusion Surgery
Mentor: Jeffrey La Belle, assistant professor

Christopher Lue Sang ’18
Electrical Engineering
Hometown: Mesa, Arizona
Soft Robotic Control System
Mentor: Junseok Chae, professor

James Lyon ’19
Engineering (Robotics)
Hometown: Rockford, Illinois
All in the Hips: Exoskeletal Design for Occupational Lift-Support and Rehabilitation
Mentor: Thomas Sugar, professor

Adriana Moya ’19
Chemical Engineering
Hometown: Tempe, Arizona
The Effects of Advanced Glycation End-Products and Type 2 Diabetes on Bone Regeneration
Mentor: Julianne Holloway, assistant professor

Andrew Nelson ’19
Biomedical Engineering
Hometown: Albuquerque, New Mexico
Active Temperature Management for Transplant Prosthetic Sockets
Mentor: Jeffrey La Belle, assistant professor

Elliott Nester ’20
Computer Systems Engineering
Hometown: Tempe, Arizona
A Deep Learning Autoencoder for EMG Changepoint Recognition in Robotic Applications
Mentor: Heni Ben Amor, assistant professor

Samjhana Devkota ’18
Computer Science
Hometown: Glendale, Arizona
Perception of Emotions Based on Tactile Facial Action Units by Individuals Who are Blind
Mentor: Troy McDaniel, assistant research professor

“FURI taught me how to deal with failure. Research is tough, but once you make a breakthrough, the feeling is indescribable.”

— Michael Garcia
Fall ’08–Fall ’09
Aerospace Engineering ’09
Lead Mechanical Design Engineer, SpaceX
<table>
<thead>
<tr>
<th>Researcher</th>
<th>Field</th>
<th>University</th>
<th>Hometown</th>
<th>Mentor</th>
<th>Project/Research Focus</th>
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</thead>
<tbody>
<tr>
<td>Gerrit Orthlieb '18</td>
<td>Biomedical Engineering</td>
<td>ASU</td>
<td>San Jose, California</td>
<td>Stephen Helms-Tillery</td>
<td>The Effect of Vibrotactile Stimulation on Upper Limb Proprioceptive Map Characteristics</td>
</tr>
<tr>
<td>Christopher Pina '18</td>
<td>Biomedical Engineering</td>
<td>ASU</td>
<td>Dover, Delaware</td>
<td>Barbara Smith</td>
<td>Design and Development of a Safe and Effective Upper Gastrointestinal Foreign Body Extraction Device</td>
</tr>
<tr>
<td>Luc Reboulet '18</td>
<td>Electrical Engineering</td>
<td>ASU</td>
<td>Chiang Mai, Thailand</td>
<td>Chao Wang</td>
<td>Seamlessly Download Data Using Prefetching Algorithms to Support Burstaneous CPU Traffic</td>
</tr>
<tr>
<td>Lei Riley '19</td>
<td>Biomedical Engineering</td>
<td>ASU</td>
<td>Yuma, Arizona</td>
<td>Yang Jiao</td>
<td>The Effect of Vibrotactile Stimulation over Multiple Feedback Sites through Proprioceptive Mapping</td>
</tr>
<tr>
<td>Wei Wei Robinson '18</td>
<td>Chemical Engineering</td>
<td>ASU</td>
<td>San Tan Valley, Arizona</td>
<td>Brent Vernon</td>
<td>Development of a Novel Soft Robotic Foot for Individuals with Social Interaction Disabilities</td>
</tr>
<tr>
<td>Aashiq Shaikh '20</td>
<td>Computer Science</td>
<td>ASU</td>
<td>Cupertino, California</td>
<td>Robert LiKamWa</td>
<td>Developing Novel 3D Printed Hydrogel-based Bioinks for Use in the Manufacturing of Biomedical Devices</td>
</tr>
<tr>
<td>Fangchi Shao '19</td>
<td>Biomedical Engineering</td>
<td>ASU</td>
<td>Linyi, China</td>
<td>Marco Santello</td>
<td>Cortical Contributions of Sensory Gating to Voluntary Movement: A Somatosensory Evoked Potential Study</td>
</tr>
<tr>
<td>Nandini Sharma '20</td>
<td>Biomedical Engineering</td>
<td>ASU</td>
<td>Phoenix, Arizona</td>
<td>Blain Christen</td>
<td>Managing Respiratory Disease with Wearable Devices</td>
</tr>
<tr>
<td>David Shumate '18</td>
<td>Biomedical Engineering</td>
<td>ASU</td>
<td>Phoenix, Arizona</td>
<td>Stephen Helms-Tillery</td>
<td>The Effects of Electrotactile Stimulation over Multiple Feedback Sites through Proprioceptive Mapping</td>
</tr>
<tr>
<td>Casey Silva '19</td>
<td>Biomedical Engineering</td>
<td>ASU</td>
<td>Tempe, Arizona</td>
<td>Mehdi Nikkhah</td>
<td>Elucidation of Stromal Fibroblast and Antifibrotic Drug on Chemo Resistance Within a 3D Model</td>
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<tr>
<td>Esther Sim '20</td>
<td>Biomedical Engineering</td>
<td>ASU</td>
<td>Scottsdale, Arizona</td>
<td>David Braffman</td>
<td>Generation of an Inducible CRISPR/dCas9-KRAB System to Modulate Gene Expression</td>
</tr>
<tr>
<td>Sean Slamka '18</td>
<td>Computer Systems Engineering</td>
<td>ASU</td>
<td>Gilbert, Arizona</td>
<td>Armando Rodriguez</td>
<td>Development of a Novel Computer Aided Design System for the Design and Implementation of an Internet-of-Things (IoT) Based Activity Tracker for Pet Care</td>
</tr>
<tr>
<td>Curtis Sparks '19</td>
<td>Engineering (Robotics)</td>
<td>ASU</td>
<td>Libertyville, Illinois</td>
<td>Panagiotis Polygerinos</td>
<td>Development of an Assistive Soft Robotic Device</td>
</tr>
<tr>
<td>Mark Sprowls '18</td>
<td>Chemical Engineering</td>
<td>Arizona State University</td>
<td>Tempe, Arizona</td>
<td>Ercira Forzani</td>
<td>Development of a Novel Soft Robotic Foot for Individuals with Social Interaction Disabilities</td>
</tr>
<tr>
<td>Bradley Taylor '20</td>
<td>Biomedical Engineering</td>
<td>ASU</td>
<td>Scottsdale, Arizona</td>
<td>Jeffrey La Belle</td>
<td>Soft Robotic Mobility Device for Use in the Manufacturing of Biomedical Devices</td>
</tr>
<tr>
<td>Robert Tichy '19</td>
<td>Mechanical Engineering</td>
<td>ASU</td>
<td>Chicago, Illinois</td>
<td>Panagiotis Polygerinos</td>
<td>Sensor Efficacy in Measuring Bone Depth for Neurosurgical Applications</td>
</tr>
<tr>
<td>Jaffalie Twaiibu '19</td>
<td>Biomedical Engineering</td>
<td>ASU</td>
<td>Llongwe, Malawi</td>
<td>Ye Hu</td>
<td>Blood-Based Mass Spectrometry and Treatment Monitoring of Tuberculosis</td>
</tr>
<tr>
<td>Conan Yates-Koch '18</td>
<td>Computer Science</td>
<td>ASU</td>
<td>Glendale, Arizona</td>
<td>Troy McDaniel</td>
<td>Development and Analysis of Reward-Adaptive Reinforcement Learning Agents</td>
</tr>
<tr>
<td>Junmin Zhong '20</td>
<td>Electrical Engineering</td>
<td>ASU</td>
<td>Nanjing, Jiangsu, China</td>
<td>Junseok Chae</td>
<td>Cervical Cancer Detector</td>
</tr>
<tr>
<td>Patrick McFarland '18</td>
<td>Biomedical Engineering</td>
<td>ASU</td>
<td>Peoria, Arizona</td>
<td>Brent Sebold</td>
<td>Infused Microparticles for Brown Norepinephrine and Adenosine Release in the Kidney</td>
</tr>
<tr>
<td>Stephen Lane '19</td>
<td>Biomedical Engineering</td>
<td>University of Massachusetts</td>
<td>Marietta, Georgia</td>
<td>Jeffrey Klein</td>
<td>Vagus Nerve Stimulation to Treat Oromotor Dysfunction in a Rat Model of Parkinson’s Disease</td>
</tr>
<tr>
<td>Miles Mabey '19</td>
<td>Engineering (Robotics)</td>
<td>ASU</td>
<td>Prescott, Arizona</td>
<td>Wenlong Zhang</td>
<td>Evaluating the Effects of a Negatively-Damped Ankle-Foot Orthosis on Gait</td>
</tr>
<tr>
<td>Ethan Marschall '18</td>
<td>Biomedical Engineering</td>
<td>ASU</td>
<td>Mesa, Arizona</td>
<td>Wenlong Zhang</td>
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<tr>
<td>Andrew Cook '18</td>
<td>Mechanical Engineering</td>
<td>ASU</td>
<td>Glendale, Arizona</td>
<td>Angela Sodemann</td>
<td>Development and Analysis of Reward-Adaptive Reinforcement Learning Agents</td>
</tr>
<tr>
<td>Bineeta Gupta '18</td>
<td>Computer Science</td>
<td>ASU</td>
<td>Gorakhpur, Uttar Pradesh, India</td>
<td>Jitendran Muthuswamy</td>
<td>Developing Novel 3D Printed Hydrogel-based Bioinks for Use in the Manufacturing of Biomedical Devices</td>
</tr>
<tr>
<td>Vaibhav Jhawar '18</td>
<td>Mechanical Engineering</td>
<td>ASU</td>
<td>Hyderabad, Telangana, India</td>
<td>Jitendran Muthuswamy</td>
<td>Developing Novel 3D Printed Hydrogel-based Bioinks for Use in the Manufacturing of Biomedical Devices</td>
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<tr>
<td>Lindsey Macias '18</td>
<td>Biomedical Engineering</td>
<td>ASU</td>
<td>Gilbert, Arizona</td>
<td>Jitendran Muthuswamy</td>
<td>In Vitro Cell Culture Model on the Influence of Advanced Glycation End-Products and Type 2 Diabetes</td>
</tr>
<tr>
<td>Talner Blitz '19</td>
<td>Mechanical Engineering</td>
<td>University of Oregon</td>
<td>Albany, Oregon</td>
<td>Jitendran Muthuswamy</td>
<td>Developing Novel 3D Printed Hydrogel-based Bioinks for Use in the Manufacturing of Biomedical Devices</td>
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<tr>
<td>Nandini Nandini '18</td>
<td>Industrial Engineering</td>
<td>ASU</td>
<td>Chandler, Arizona</td>
<td>Mehdi Nikkhah</td>
<td>Developing Novel 3D Printed Hydrogel-based Bioinks for Use in the Manufacturing of Biomedical Devices</td>
</tr>
<tr>
<td>Raquel Camarena '18</td>
<td>Agricultural Engineering</td>
<td>ASU</td>
<td>Tempe, Arizona</td>
<td>Chao Wang</td>
<td>Developing Novel 3D Printed Hydrogel-based Bioinks for Use in the Manufacturing of Biomedical Devices</td>
</tr>
</tbody>
</table>

**ASU Kern Project**

**KEEN supported students**

**GCSP student researchers**

**MORE student researchers**

**Tanner**

**Blitz**

**Mechanical Engineering**

**Jhawar**

**Mechanical Engineering**

**Cook**

**Mechanical Engineering**

**Gupta**

**Computer Science**

**Alam**

**Biomedical Engineering**

**McFarland**

**Biomedical Engineering**

**Lane**

**Biomedical Engineering**

**Mabey**

**Engineering (Robotics)**

**Marschall**

**Biomedical Engineering**

**Vance**

**Biomedical Engineering**

**Jhawar**

**Mechanical Engineering**

**Gupta**

**Biomedical Engineering**

**Macias**

**Biomedical Engineering**
GCSP student researcher  |  Graduation: May 2020  |  Hometown: Mesa, Arizona

Mechanical Characterization of 3D Porous Electrospun Nanoscaffolds to Optimize Tissue Regenerative Response

**Mentor:** Vincent Pizziconi, associate professor

Bioengineering the cell microenvironment is critical when developing cell-based therapeutic devices for regenerative medicine. The focus of this project is to characterize the micromechanical properties of 3D porous electrospun nanoscaffolds intended to serve as cell substrates and aimed to match an individual's anatomy and tissue regenerative capacity. Nanoscaffolds electrospun from hydrogel polymer solutions were nanomechanically characterized using a custom test system with specialized grips to determine the "stiffness" of scaffolds of different crosslinking densities. Once fully characterized, scaffolds can then be "tuned" to elicit optimal tissue regeneration in patients. This research is important for the realization of precision medicine's potential.
Gait Optimization for Bio-Inspired Robotics

Mentor: Hamidreza Marvi, assistant professor

A bio-inspired platform for a search and rescue vehicle with optimized stride length and frequency at various saturation levels of sand is the goal of this research. Measurements and observations of the animal, Basiliscus basiliscus or the basilisk lizard, have provided baseline stride length, frequency, weight and gait parameters. Variance of stride length and frequency are tested with the developed robot and optimized results are presented. Future work includes scalability of the platform and application in space exploration.
Security

As technology develops at a faster rate, there is a growing need to develop engineering systems to keep people and infrastructure secure, including securing cyberspace, developing secure communications, developing self-healing systems resilient to attack and identifying, monitoring and reducing threats. Fulton Schools researchers — faculty and students — are addressing issues of national defense, homeland security, border security, cyberwarfare and more, devising technology solutions as well as legal, policy and social implications.

FURI student researchers

Clayton Bliss ‘20
Mechanical Engineering
Hometown: Tijeras, New Mexico
How Surface Roughness Affects Interfacial Strength of Steel and Ice
Mentor: Jay Oswald, assistant professor

Brandon Dawson ‘18
Aerospace Engineering
Hometown: Peoria, Arizona
Aerodynamic Propeller Modelling
Mentor: Wenlong Zhang, assistant professor

Nicholas Debeurre ‘18
Computer Science
Hometown: Scottsdale, Arizona
Efficient Hash Family Creation and Implementation
Mentor: Charles Colbourn, professor

Aditya Deotale ‘18
Computer Science
Hometown: Chandrapur, Maharashtra, India
What’s up with Privacy?: User Preferences and Privacy Concerns in Intelligent Personal Assistants
Mentor: Subbarao Kambhampati, assistant professor

Breydan Dotson ‘18
Aerospace Engineering
Hometown: Anthem, Arizona
Development and Validation of Active Pixel Sensors for Star Tracker Applications
Mentor: Daniel White, lecturer

Michael Durso ‘19
Materials Science and Engineering
Hometown: Phoenix, Arizona
Synthesis and Characterization of Traditional and Chalcogenide Nanocomposites
Mentor: Sefaattin Tongay, assistant professor

Collin Foster ‘18
Mechanical Engineering
Hometown: Tucson, Arizona
Damage Tolerant Design Guidelines for Seamless Carbon Fiber Composite Structures for Pressurized Cylinders
Mentor: Aditi Chattopadhyay, professor, and Masoud Yekani Fard, assistant research professor

Armita Claire Jordan ‘19
Mechanical Engineering
Hometown: Gilbert, Arizona
Effects of Thermal Deformation in Constrained Sheet Metal
Mentor: Timothy Takahashi, professor of practice

Brandon Kwan ‘20
Mechanical Engineering
Hometown: Scottsdale, Arizona
Effect of Flow Rate on Interfacial Fracture between Ice and Steel
Mentor: Jay Oswald, assistant professor

Nicholas Magana ‘18
Electrical Engineering
Hometown: Scottsdale, Arizona
Modeling, Analysis, Control, and Design of Hypersonic Air Vehicles Using Stealth Technology
Mentor: Amaldo Rodriguez, professor

Luke Mains ‘19
Computer Systems Engineering
Hometown: Phoenix, Arizona
Randomized Construction of Homogeneous Scattering Hash Families
Mentor: Charles Colbourn, professor

Zachary Monroe ‘18
Software Engineering
Hometown: Chandler, Arizona
How Can Machine Learning Improve Password Security?
Mentor: Ajay Bansal, assistant professor

Akshay Nalla ‘19
Mechanical Engineering
Hometown: Amalapuram, Andhra Pradesh, India
Mechanical Analysis of Reinforced Foam Core Composites
Mentor: Aditi Chattopadhyay, professor

Alex Nou ‘19
Computer Science
Hometown: Mesa, Arizona
Personalized Browser History Anonymization
Mentor: Huan Liu, professor

Bryce Podroza ‘19
Computer Science
Hometown: Scottsdale, Arizona
Stock Market Portfolio Optimization
Mentor: Amaldo Rodriguez, professor

Tanner Rosenthal ‘19
Electrical Engineering
Hometown: Tempe, Arizona
Precision Following of a Ground Vehicle by a Fully Instrumented Quadcopter with a Go-Ahead Audio-Visual Support Capability
Mentor: Armando Rodriguez, professor

Mohamed Sabet ‘19
Electrical Engineering
Hometown: Surprise, Arizona
Ground-Based Robotic Vehicle Following and Separation Control: An Image Processing Approach
Mentor: Armando Rodriguez, professor

Andrew Shurman ‘18
Computer Science
Hometown: Gilbert, Arizona
Efficient Algorithms for the Construction of Low-Density Parity-Check Codes
Mentor: Charles Colbourn, professor

Cesar Tamayo ‘20
Computer Systems Engineering
Hometown: Havana, Cuba
Deep Predictive Models for Collision Risk Assessment in Autonomous Driving
Mentor: Heni Ben Amor, assistant professor

Michael Tucker ‘18
Mechanical Engineering
Hometown: Yardley, Pennsylvania
Developing Fatigueless 3-phase Nanocomposite Sensors
Mentor: Masoud Yekani Fard, assistant research professor

MORE student researchers

Sai Doddalla ‘18
Computer Engineering
Hometown: Tenali, Andhra Pradesh, India
Around the Corner Imaging at Terahertz
Mentor: Georgios Trichopoulos, assistant professor

Karthis Kambam ‘18
Electrical Engineering
Hometown: Tirupati, Andhra Pradesh, India
Algorithms for Learning, Cooperation and Coordination of Multi-Agent Systems in the Presence of Uncertainties
Mentor: Wenlong Zhang, assistant professor

Bharathi Kashyap ‘18
Electrical Engineering
Hometown: Hassan, Karnataka, India
Wearable Antenna System for Touchless Gesture Recognition and Interaction
Mentor: Georgios Trichopoulos, assistant professor

Mahmoud Sakr ‘18
Electrical Engineering
Hometown: Cairo, Egypt
Compact Terahertz Real-Time Imaging System
Mentor: Georgios Trichopoulos, assistant professor

“As a first-generation student, my understanding of what my career path could be was limited. FURI allowed me to expand my knowledge, apply engineering concepts firsthand and inspired me to keep moving forward.”

— Mariela Robledo
FURI Summer ‘11–Spring ‘13
Chemical Engineering ‘13
Senior Manufacturing Supervisor, Medtronic
Emily Alcazar

The objective of this research is to advance the current state of 3D printed concrete for its use to be industrialized in the future for faster, cheaper and cleaner construction. During the spring 2018 semester, successful prints have been made while focusing on the rheology parameters of the mix. To analyze the small-scale 3D printed samples, scans were conducted to represent the prints as point clouds. MATLAB was used to compare the actual prints to the CAD model through identifying the location of the defects. The next step is to develop a perfected printing process for the technology’s expansion.
Sustainability

The central thrust behind sustainability is the capacity of metropolitan areas to grow and prosper without destroying or depleting natural resources. The Fulton Schools’ research focuses on restoring and improving urban infrastructure, access to clean water and air, advanced construction techniques and management, environmental fluid dynamics, transportation planning, as well as geotechnical and geoenvironmental engineering.
What is a faculty mentor?

Fulton Schools faculty members guide students through the research process in their role as FURI and MORE research program mentors. Throughout the semester-long program, mentors meet with their student researchers one-on-one and in lab settings for training, professional etiquette coaching and to serve as their students’ guide for writing abstracts and designing research posters. Faculty mentors provide advice and professional development opportunities, including submitting research to conferences, applying for travel grant funding, submitting papers for publication and discussing career goals.

How to get involved

Do you have students conducting research in your lab? Encourage them to apply for FURI or MORE research funding. Faculty members can mentor up to five students in each program per semester.

Students will submit their research proposal, five research references, timeline, budget, personal statement, résumé and unofficial transcript in their FURI or MORE application. Then faculty mentors are prompted to submit a Faculty Mentor Proposal Support Letter. If the application is accepted by the faculty committee, the student and faculty member will receive FURI or MORE funding for the semester.

If you don’t currently have undergraduate or graduate student researchers and would like to find qualified researchers, you can post your research opportunity for students to connect with you.

Find out more at furi.engineering.asu.edu

Mentors

“Connect with your faculty mentors every chance you get as they will be invaluable as mentors even after leaving ASU.”

— Abhishek Dharan
FURI Fall ’13–Spring ’14
Electrical Engineering ’14
Medical Student, Paul L. Foster School of Medicine at Texas Tech University Health Sciences Center El Paso
Joshua Loughman
lecturer

Narciso Macia
associate professor

Hamidreza Marvi
assistant professor

Abdel Mayyas
assistant professor

Troy McDaniel
assistant professor

Ryan Meuth
lecturer

Gary Moore
assistant professor

Jitendran Muthuswamy
associate professor

Narayanan Neithalath
professor

David Nielsen
associate professor

Mary Niemczyk
associate professor

Mehdi Nikkhah
assistant professor

Jay Oswald
assistant professor

Giulia Pedrielli
assistant professor, senior sustainability scientist

Yulia Peet
assistant professor

Pedro Peralta
professor

Francois Perreault
assistant professor

Patrick Phelan
professor

Vincent Pizziconi
associate professor

Panagiotis Polygerinos
assistant professor

Kaushal Rege
professor

Fengbo Ren
assistant professor

Yi Ren
assistant professor

Andrea Richa
professor

Bruce Rittmann
professor

Armando Rodriguez
professor

Bradley Rogers
associate professor

Konrad Rykaczewski
assistant professor

Marco Santello
professor

Brent Sebold
lecturer

Jorge Sefair
assistant professor

Jae-Sun Seo
assistant professor

Karl Sieradzki
professor

Michael Sierks
professor

Shahnawaz Sinha
assistant research professor

Barbara Smith
assistant professor

Angela Sodemann
assistant professor

Siddharth Srivastava
assistant professor

Sarah Stabenfeldt
associate professor

Thomas Sugar
professor

Maxim Sukharev
associate professor

Timothy Takahashi
professor of practice

Mary Laura Lind Thomas
associate professor

Sefaattin Tongay
assistant professor

César Torres
associate professor

Georgios Trichopoulos
assistant professor

Amy Trowbridge
senior lecturer

Arun Varman
assistant professor

Brent Vernon
associate professor

Chao Wang
assistant professor

Paul Westerhoff
professor

Daniel White
lecturer

Jeffrey Wishart
clinical assistant professor

Masoud Yekani Fard
assistant research professor

Wenlong Zhang
assistant professor

Ming Zhao
associate professor

“Mentoring is an extremely rewarding experience, and it is the biggest reason I became a faculty member! I enjoy reading FURI students’ reflections and seeing their growth in learning the research process.”

— Heather Emady, assistant professor

“I had the possibility to try new research areas that I had no personnel to work on, the opportunity to return to basic research mentoring and revise my mentoring style, and got to better know our students.”

— Francois Perreault, assistant professor

“Encourage your graduate students to also take a mentoring role.”

— Micah Lande, assistant professor, Diane and Gary Tooker Professorship for Effective Education in Science, Technology, Engineering and Math (STEM)
Each semester, we invite FURI alumni to share where they are now as they embark on their careers or the pursuit of advanced degrees. They also look back on how FURI helped them build valuable skills, learn about themselves and succeed in their current endeavors. In spring 2018, 145 FURI alumni responded to our survey.

**FURI helped me learn more about my own interests and what path I wanted to pursue after earning my degree. I did my undergraduate research in natural language processing/natural language understanding, and I now work on the Google Assistant. The bit of background I had in NLU has been helpful when working with NLU systems at Google.”**

— Amy Baldwin  
FURI Spring ’14–Spring ’15  
Computer Science ’15  
Software Engineer, Google

**Participating in FURI laid the foundation for the research work I am now pursuing in energy engineering. The core research skills I developed as a FURI student — for example critical reading, concise writing, formulating research questions, collaboration, learning to operate technical equipment and presenting — are proving invaluable in my work.”**

— Ngoni Mugwisi  
FURI Summer ’14–Spring ’15  
Electrical Engineering ’17  
Rhodes Scholar; DPhil Candidate, University of Oxford
“FURI was the venue where I first learned how I could advance my own ideas into real, tangible projects.”

— Daniel Bishop
FURI Spring '06–Spring '09
Bioengineering '09
CEO and Co-founder, Qualaris Healthcare Solutions, Inc.

“FURI helped me develop a passion for innovative ways to help patients with biomaterials. Many of the ortho cases I saw as a medical student were starting to use concepts I helped study in the lab!”

— Amye Farag
FURI Fall '09–Spring '10
Biomedical Engineering, Biochemistry '11
Emergency Medicine Resident, Mercy St. Vincent's Medical Center in Toledo, Ohio

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Acknowledgments

Financial support for the FURI program is made possible by Ira A. Fulton. Special thanks to all of the mentors, family and friends for supporting our students through this program. We appreciate the efforts of all who helped make this program a success, especially:

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Selcuk Candan
Michael Caplan
Bridgett Cantu
Oswald Chong
Scotty Craig
Arnaud Ehgner
Peter Fox
Jhanaye Glynn
Michael Goryll
Debra Gower
Stephen Helms Tillery
Sharon Hsiao
Cheryl Jennings
Jessica Jensen
Nathan Johnson
Lina Karam
Suzanna Kirkham
Jing Li
Cortney Loui
JoAnne McDermand
Ann McKenna
Kelley McManus
Barbara Minich
Cynthia Moayedpardazi
Bin Mu
Beverly Naig
Jay Oswald
Mariah Pacey
Joe Palais
Yulia Peet
Kristen Peña
Francois Perreault
Deb Prewitt
Yueming Qiu
Cheryl Roberts
Martin Reisslein
Layla Reitmeier
Carrie Robinson
Arthur Sainz
Wesley Scruggs
Barbara Smith
Jenna Snowberger
Angela Sodemann
Sohum Sohoni
Tomi St John
Alicia Stiers
Sefaattin Tongay
Shane Underwood
Veronica Venable
Brent Vernon
Gary Waissi
Xiao Wang
Qing Hua Wang
Wenlong Zhang

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Our scholars are preparing to solve global challenges by combining academic and extracurricular experiences at ASU as part of the Grand Challenge Scholars Program, recognized by the National Academy of Engineering.

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As a scholar, you will gain unique opportunities and experiences through mentorship by faculty, access to funding for research opportunities and enrollment in FSE 150: Perspectives on Grand Challenges for Engineering — with specially designed curriculum and exclusive access to guest speakers.

If you share our focus on the societal impact of engineering or want to dive into an innovative educational environment, join the Grand Challenge Scholars Program.

Apply today: links.asu.edu/Apply-for-GCSP
What does it mean to bring an entrepreneurially minded approach to research?

In a dynamic and interconnected world, it is critical for the Fulton Schools to teach a technical skillset along with an entrepreneurial mindset that fosters curiosity, connections and the creation of value (3Cs). Programs such as the Fulton Undergraduate Research Initiative teach students how to apply entrepreneurial thinking to a given career or field, leading to innovative solutions that create extraordinary value.

The entrepreneurial mindset is a problem-solving approach that begins with curiosity about our changing world, connecting information from various research findings, and identifying unexpected opportunities to create value in their project. They synthesize information from multiple sources as well as the discoveries made in their work to develop a deep understanding of the end user involved. Researchers anticipate societal and economic trends to provide valuable solutions for new or improved business opportunities.

KEEN proudly supports FURI and the program’s efforts to instill curiosity, connections and the creation of value into research projects.

Learn more about KEEN and the 3Cs at links.asu.edu/keenstudentgrant
“I strongly believe you cannot have a great city without a great school of engineering.”

— Ira A. Fulton

At Arizona State University, we’ve been educating engineers for Arizona and the world for nearly 60 years. With more than 20,000 students, we are building the engineers of the future and pursuing the discoveries and solutions to challenges facing society.

In 2003, Ira A. Fulton, founder and CEO of Arizona-based Fulton Homes, established an endowment of $50 million in support of ASU's College of Engineering and Applied Sciences.

His investment served as a catalyst, enabling the development of a dynamic portfolio of strategic initiatives that benefit our students and faculty and the communities where they live and work.

Throughout the years, Ira A. Fulton has remained an active supporter of the school that bears his name. He is a familiar face to students and a regular presence at events such as this semiannual FURI Symposium.