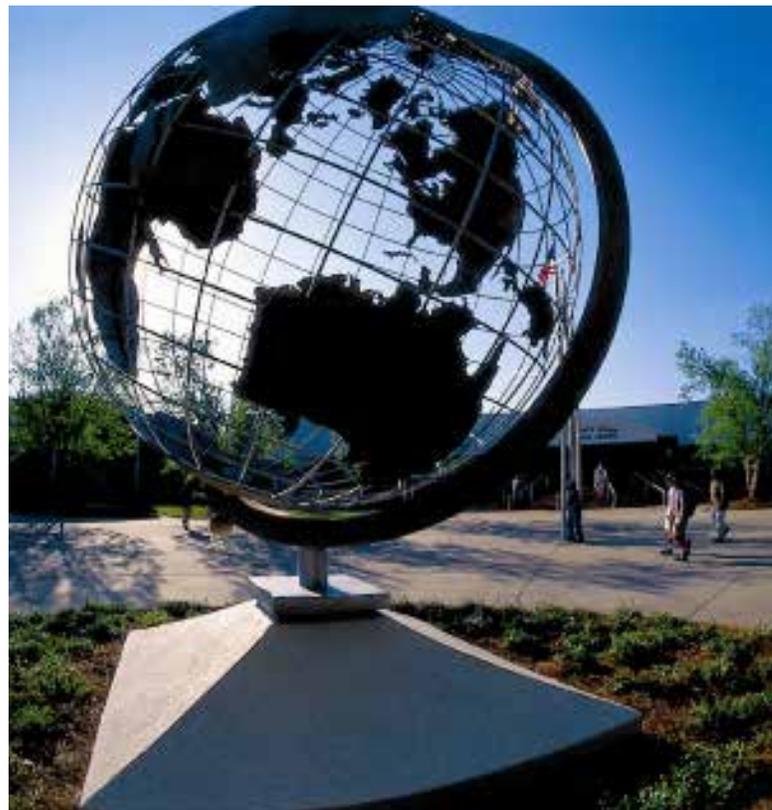




KSU UNDERGRADUATE RESEARCH & CREATIVE ACTIVITY NEWSLETTER

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UNDERGRADUATE RESEARCH



AT THE DATA SCIENCE SHOWCASE

by Kaelyn Ireland
Major: Psychology/Modern Language & Culture

KSU held its third annual Data Science Showcase this spring. This year, four undergraduate students who were previously recognized at R Day, another event hosted by the Department of Statistics and Analytical Sciences each fall, gave PowerPoint presentations about their research to their peers.

Professor Susan Mathews Hardy, senior lecturer of statistics and organizer of the Data Science Showcase, emphasized the Showcase's goal of drawing attention to the minor in Applied Statistics and Data Analysis offered by the Department of Statistics and Analytical Sciences. Peer ambassadors attended the event

this year to answer questions about the minor. Hardy said that the minor is flexible and teaches analytical skills that are highly valued by employers. Students take three mandatory classes and choose two additional courses that best suit their future educational or career goals.

When asked about what got them interested in conducting research and participating in this event, undergraduate students responded that they had a mix of personal and professional reasons. "It was a combination of interest in research, love of statistics, and a desire to start networking," said senior Psychol-

ogy major Kelly Hoffman. Mentored by Susan Hardy, Dr. Gene Ray, and Dr. Sherry Ni, Hoffman worked to determine which types of trees should be planted to reforest areas that have been deforested due to natural disaster or an economic demand for wood. She said that she chose her topic because her father and grandfather, both of whom have backgrounds in agriculture, inspired a love of agriculture and other sciences in her from an early age.

Jan Strydom, senior Mathematics major and Applied Statistics minor, said that participating in the Data Science Showcase was a great opportunity to get presentation experience before going on to pursue a PhD. Strydom and fellow students Matthew Richmond and Nick Vinson (recently graduated), mentored by Dr. Jennifer Priestley, looked at the effect that using an opiate as a painkiller has on heroin use, using the NSDUH (National Survey of Drug Use and Health) dataset. “We found that if you had taken any form of an opiate, that you would be 11.7 times more likely to have taken heroin as well,” Strydom said of the results. His motivation to explore this topic stems from a desire to help people overcome addiction. He says that he has lost four close friends to heroin use or drug overdoses in the last two years.

These are timely topics, given increasing global concern about environmental issues and current discussions about the opioid epidemic in the United States and other public health concerns about addiction. Another topic of interest at the Data Science Showcase this year was *Grow Baby Grow*, a research initiative examining premature babies’ weight, length, head circumference, and BMI to make predictions about morbidity and mortality among them. Professor Hardy is particularly enthusiastic about this ongoing research, saying that these researchers are using data to save babies’ lives. To learn more, see the [Spring 2015 edition of the Undergraduate Research Newsletter](#) for an exclusive article about *Grow Baby Grow*. These projects highlight how statistics can be put to practical use, even saving lives.



SPECIAL ISSUE OF KJUR

COLLEGE OF THE ARTS

by Julia Orr

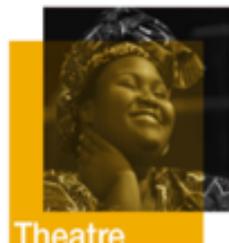
Major: Ecology, Evolution, & Organismal Biology

The *Kennesaw Journal of Undergraduate Research*, a peer-reviewed scholarly journal also known as KJUR, published a special issue that focused on the College of the Arts, the first special issue in KJUR's history. As the titles show, contributions ranged from art history, music, and dance, among others. As Dr. Patty Poulter, Dean of the College of the Arts, noted in the forward to the special issue, "Scholarly and creative exploration are central to the arts, and supporting students in these endeavors is central to the mission of the College of the Arts."

The journal was filled with creative research put together by many students and faculty, including Dr. Sarah Holmes. When asked about the College of Arts edition of KJUR, Dr. Holmes said, "All of the faculty contributed one hundred and ten percent. They were reviewers, they were faculty mentors, they were co-editors."

Currently, Dr. Holmes is diving head-first into the world of Pilates. She summarized her work by stating, "So I'm kind of in a couple different areas right now. I have my critical, theoretically based research that looks at Pilates from a race, class, and gender perspective. Then I look at it from the book which is really the history of Pilates withstanding everything that it has been through. Then I have another component of my research, which is also Pilates, but it is really more towards engaging the students in it."

There is an area of the wall in Dr. Holmes' office that is dedicated to the brainstorming process of her book. On the topic of her upcoming book, she said, "It's about a series of interviews with the leaders in the Pilates communities who worked with either the creator, Joseph



College of the Arts

Special Issue of

KennesawJournal
of Undergraduate Research



Hubertus Pilates, or had a really close a connection with what we call the first and second-generation teachers.” The book is due to the publishing company in July of 2018, and Dr. Holmes says it’s really exciting, but she has a lot of work to do until then.

Dr. Holmes works with five student researchers who work in conditioning classes and on Pilates reformer training. The students are learning the correct movements for the equipment and how to recognize any imbalances within their work. Dr. Holmes wants the study to benefit the students’ dance technique to help them get more comfortable and confident with their movements. “I want to correlate their technical performance in the classroom and Pilates, and then correlate it to an increase of the self-realization that they can actually do this [dance] professionally.” Dr. Holmes is looking to move forward with this study and watch it grow with new students in the upcoming years.

To read the articles in the special issue of KJUR, visit: <https://digitalcommons.kennesaw.edu/kjur/vol5/iss2/>



Dr. Sarah Holmes
Assistant Professor
Department of Dance

Articles

-  PDF **The Influence of Chimú Metalworks on Inca Metalworks**
Maria Shah, Hannah Pelfrey, and Jessica J. Stephenson

-  PDF **The Danger of Unqualified Dance Instruction in Private Dance Studios and Social Media**
Angelina M. Pellini

-  PDF **Spectacular Spaces of Consumption**
Ellen G. Watkins

-  PDF **Caitlin Keogh: Feminine Feminism**
Madeline Beck

-  PDF **Mood and Mode: The Impressionistic Commonalities of Claude Debussy and John Coltrane**
Simon B. Needle and Edward Eanes

THE BIOINNOVATION LAB

by Eun Sol Chang
Major: Molecular & Cellular Biology

Beer, bats, bacteria -- What is common among these three things? Aside from the fact that they all start with the letter B, they are some of the topics being studied in the BioInnovation Lab at Kennesaw State University. Headed by Dr. Christopher Cornelison and his postdoctoral researcher Dr. Kyle Gabriel, nine undergraduate students and a master's student are working on several projects, all related to bringing benefits to agriculture and economy.

Undergraduate student Daniel Wokoma works on the beer project, in which the group is trying to find the novel yeast strains tolerant to high concentrations of alcohol. He stains the yeast cells and views them on a microscope, and whichever yeast cells that are stained blue are the dead ones while the cells that are not stained are alive. After isolating, the tolerant yeast strain is used to make beer, and the students characterize its aroma profile using gas chromatography and mass spectrometry. Usually beer is only tested through taste and smell, which wastes resources and makes it hard to predict when the beer will go sour. Collaborating with local breweries such as Dry County Brewing and Monday Night Brewing, the lab is providing analytical tests that could be too costly for small craft breweries. "This will change the way we view brewing, and change the way we view microorganisms" says Daniel. He learned about this research opportunity through attending senior seminar, and says he learned most of the techniques he uses in lab after joining the team. "There is a lot of literature on how to use instruments, but there isn't a protocol for specific yeasts, so we have to teach ourselves a lot of the times."

There have been numerous sightings of the White-Nose Syndrome in bats in the Eastern U.S., and master's student Kelly Lutsch is working on locating bats and the fungal pathogen that causes White-Nose Syndrome on bats that live under bridges. Bridges are unique habitats to bats; they are not naturally occurring environments, but they mimic the habitats that



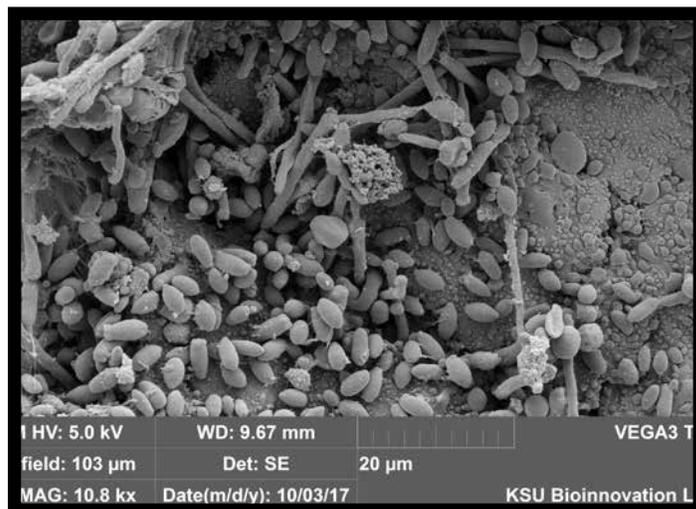
Undergraduate Daniel Wokoma setting up a hemocytometer to quantify and evaluate the viability of a yeast isolated from a local brewery and exposed to high concentrations of ethanol

bats like to live in, such as caves. She uses large cotton swabs to swab bats and the underside of bridges to find the fungus that causes the White-Nose Syndrome. As an undergraduate, she focused on environmental sociology, and after graduating, she worked as a bat research technician before starting her master's in integrative biology at KSU. In the BioInnovation Lab, undergraduate and graduate students are not treated differently except that graduate students are expected to put in more time. The students are trained so that later on, they are able to conduct their own research.

Undergraduate student Brooke Warres is doing her research on plant growth and bacteria. She is currently isolating bacteria from soil samples and then will test it on plants such as tomato plants to see if the bacteria promotes growth. Later on, fungal pathogens will be introduced to see if the bacteria fights off the pathogen. This can help with reducing the use of pesticides and fertilizers, making the produce we consume more sustainable and better for the environment. She recommends undergraduate research to anyone who is interested; it is an entirely different level of learning of lab techniques. Being able to apply scientific methods and learning to think in a different way are some of the benefits of undergraduate research, and she recommends students start as early as possible with a professor who is willing to work with them about something they are passionate about.

Dr. Cornelison talks about working with large groups of undergraduates in the laboratory:

“Working with undergraduates in a research lab presents challenges as well as opportunities. Undergraduates usually join a lab without experience and without the intellectual confidence to take on complex tasks independently. However, they are enthusiastic and passionate about learning. The key to creating a successful environment for undergraduate researchers is to harness their enthusiasm by explaining why their project and specific contributions are important and how their work can be used on a broader scale to improve our world. It is also important to give them tractable tasks early on so that they are successful initially. This helps build their confidence and encourages them to take on larger roles in the lab and not be intimidated by new tasks. As a PI [Primary Investigator], I try to remember how I felt when joining my first lab. It’s easy to allow your expectations to drift as you move through your career, but we all started



Electron micrograph of a mixed biofilm of yeast and bacteria attached to the interior surface of a barrel used to age beer. Image courtesy of Dr. John Neville.

as undergraduates and began our research careers lacking the skills that now define us. By remembering this it is easier to show patience and compassion to these student researchers. One day they will be leading the university laboratories, and I hope they look back at their time in my lab as favorably as I look back on my initial experiences in research and feel a sense of duty to pass that knowledge and opportunity on to the next generation of emerging scientists.”



Petri plates used to isolate yeast from samples submitted by local breweries

KSU STUDENTS

AT NCUR 2018

by **Robbie Cronin**
Major: **Chemistry & Biochemistry**

The Council on Undergraduate Research (CUR), defines undergraduate research as, “An inquiry or investigation conducted by an undergraduate student that makes an original, intellectual, or creative contribution to the discipline.” One place for undergraduates to present their research is NCUR, or the National Conference on Undergraduate Research.

One of the best aspects of NCUR is that it showcases research from all disciplines, which is rare among research conferences. Sharonjeet Kaur, the Secretary of Undergraduate Research Club and a presenter at NCUR

in 2017 and 2018, said that when she looks around at the different posters, she sees research on such diverse topics, from immigration to public health. NCUR helped Sarai Bauguess, the Vice President of Undergraduate Research Club and three-time presenter at NCUR (2016-2018), expand her horizons, show her the kind of research she could do in the future, and sparked the idea for her honors project. Emma Evans, Undergraduate Research Club’s Treasurer and NCUR presenter in 2017 and 2018, said NCUR helped her to meet people from around the country who had a lot of interests that were both different from and similar to hers.

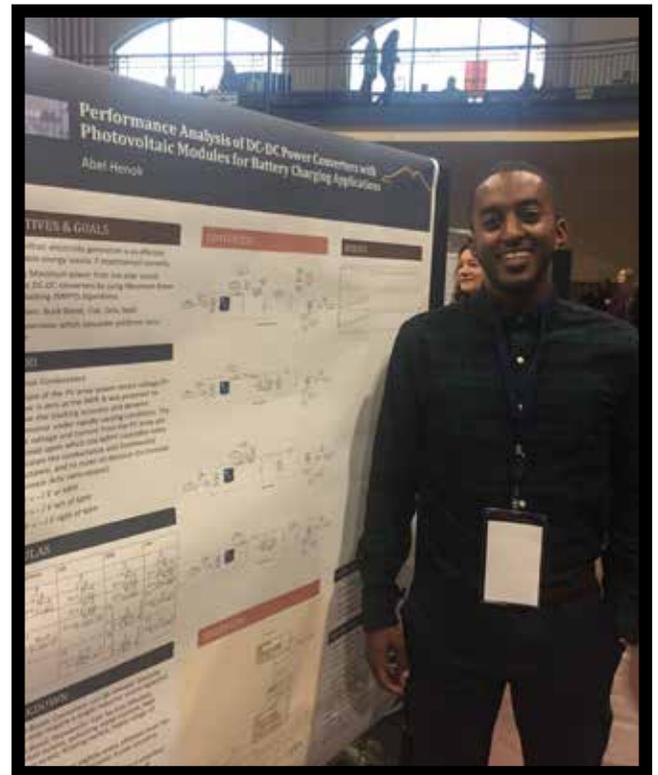


**Group Photo of Kennesaw State University Students, Faculty, and Staff
University of Central Oklahoma**

Although NCUR attendees come from a wide variety of schools, disciplines, and backgrounds, they have in common enthusiasm for the research process.

NCUR 2018 was held at the University of Central Oklahoma, and KSU had the second-most presenters at the conference, after the host institution. KSU fully funded over 100 students, faculty, staff, and administrators to attend NCUR 2018.

Students who are accepted to present at NCUR 2019, however, will not have to worry about travel expenses because it will be held at KSU. If you want to be involved with NCUR, then according to Dr. Amy Buddie, Director of Undergraduate Research here at KSU, the best way you can get involved is to submit an abstract if you have any ongoing or completed research in Fall 2018. You can also volunteer to help with registration, greet visitors, and help out with excursions that are planned for attendees after the conference.



Abel Henok
Electrical Engineering



Dakota Lewis
Architecture

KSU Psychology Lab Investigates

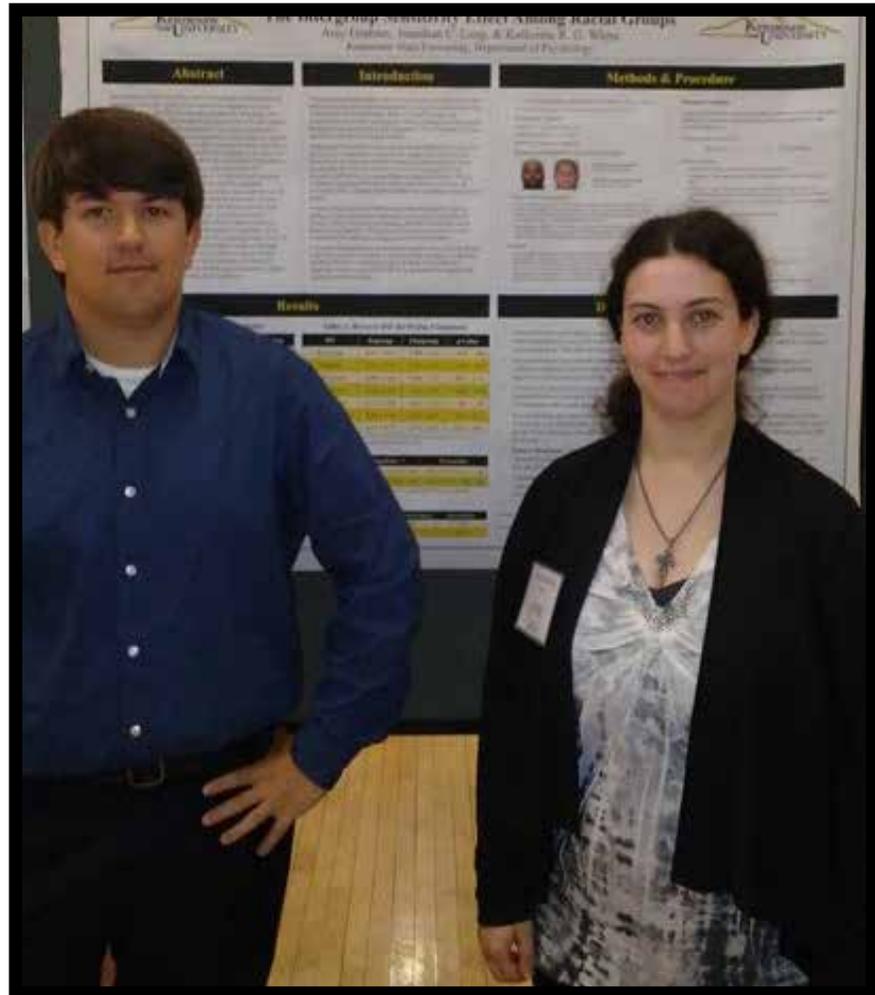
the Intergroup Sensitivity Effect

by Kaelyn Ireland
Major: Psychology/Modern Language & Culture

Dr. Katherine White and her undergraduate research assistants, Scarlet Hernandez, Caleb Lang, and Amy McLeroy, are studying the Intergroup Sensitivity Effect (ISE) in the Laboratory for the Study of Social and Cultural Phenomenon (SSCP). Previous research on the ISE has focused on how members of a group (e.g., members of the same nationality or religion, called an ingroup) respond to criticism coming from someone who is not a member of their ingroup (outgroup). Researchers in the SSCP are currently investigating the ISE as it pertains to members of different racial groups.

Hernandez, Lang, and McLeroy explained the procedures and results. They used an online setup to gather as much data from KSU students as possible, the majority of whom were white or black. They are also in the process of gathering data from a predominantly Hispanic campus in Texas for comparison. Results from KSU participants fell in line with previous research. Both white and black participants responded more negatively to criticism delivered by an outgroup speaker than an ingroup speaker. However, there was one unexpected result. Unlike in previous studies, white participants responded more positively to praise from an outgroup speaker, particularly if the individual was black.

The researchers are interested to see whether the data from the Texas institution has results that are similar to their own, or more similar to previous research about the ISE. In the future, other populations beyond these two institutions, as well as populations beyond



Caleb Lang and Amy McElroy
Psychology Undergraduate Research Conference
Georgia State University, October 2017

university campuses, should be studied to see how well the results generalize.

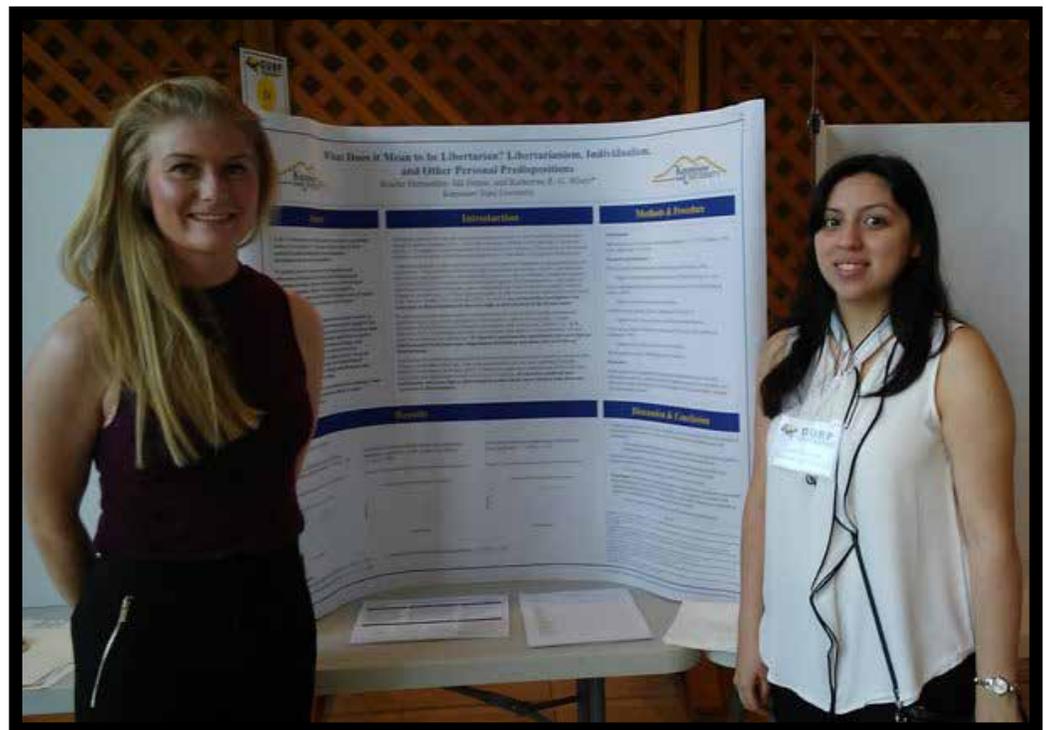
Dr. White says that application of this research can improve intergroup communication—that is, communication between ingroup and outgroup members. Balanced criticism, a technique in which someone critiques their own group before criticizing the other group, is one way to facilitate communication: here is what our group is doing to address our issues; now, here is where your group has issues—what will you do to address them? Another is to comment on what they are doing well first; by “buttering up” the person to whom they are giving constructive criticism, the critic makes them more receptive to what they are about to say. These techniques can reduce the ingroup member’s perception that the outgroup member has less authority on the subject, increasing the effectiveness of the outgroup speaker. “This research can make a difference in communication between people during a time where it seems like people are not listening to each other,” Hernandez said.

Dr. White, Hernandez, Lang, McLeroy, and a former research assistant, Ida Hepso (graduated in December 2017), have presented at the Georgia Undergraduate Research in Psychology conferences at KSU in April 2017 and 2018, and at the Psychology Undergraduate Research Conference at Georgia State University in October 2017. They also mentioned the possibility of turning this research into a manuscript and pursuing publication in the future.

“Getting to share our research at conferences has been one of the most fulfilling experiences of my undergraduate career,” Lang, a senior psychology major, said. He looks forward to a career in research and is grateful for the experience he gained while working with Dr. White and his peers in the SSCP lab.

Lang and Hernandez agreed that a big challenge in learning research skills was the tedium of working with the data they obtained from participants. Great attention to detail is required so that results are not misrepresented. McLeroy commented that working on a research team was good experience for learning how to work well in a group, and presenting research was an opportunity to improve upon her public speaking skills.

As for the future, Dr. White plans on continuing with this vein of research from different angles. Exploring how and why people identify with groups they are not members of (e.g., white individuals supporting the Black Lives Matter movement even though they, themselves, are not black), figuring out more about how to counteract the ISE, and seeing whether recipients of constructive criticism intend to change—and whether or not they actually do—are all possibilities.



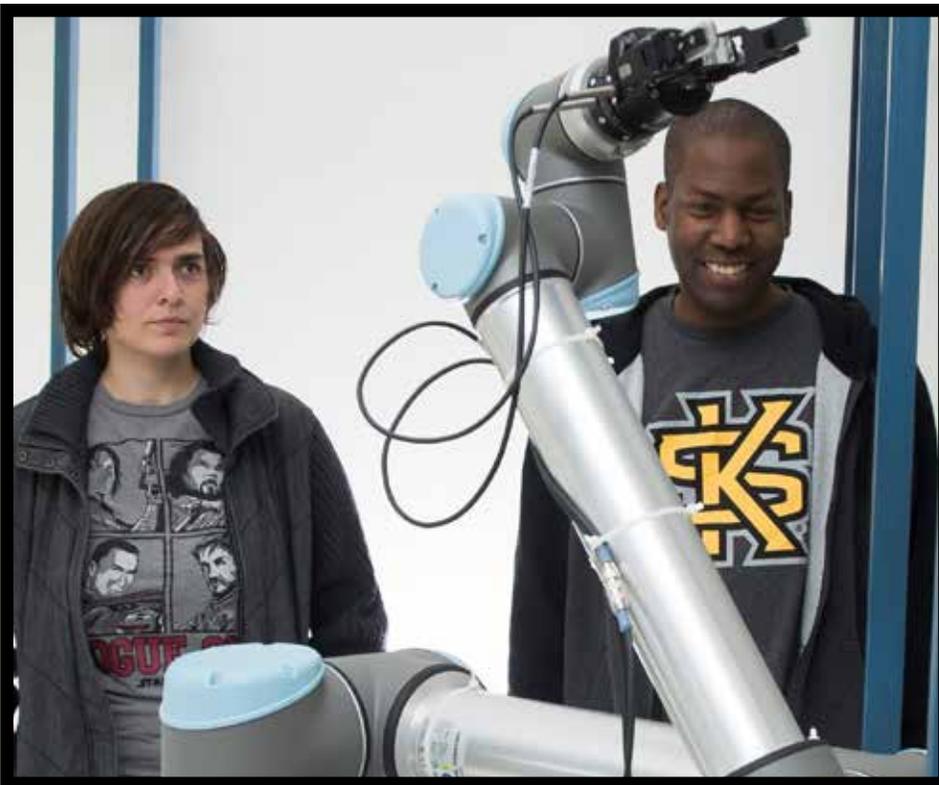
Ida Hepso and Scarlet Hernandez
Georgia Undergraduate Research in Psychology Conference
Kennesaw State University, April 2018

Mechatronics Engineering Students Get Hands-On Experience with Robots

by Kaelyn Ireland
Major: Psychology/Modern Language & Culture

Why did Dr. Matthew Marshall's students decide to get involved in mechatronics research? Because robots are cool, but that is far from the only reason—even if it is a pretty good one.

Twelve students, grouped into fours to work on three different projects, are gaining hands-on experience working with robots that many of them will interact with in their future careers. The research is part of a directed study class offered each semester to students enrolled in the Mechatronics Engineering program as a way to gain practical, technical experience. The program has partnered with the world's largest floor-covering company, Mohawk Industries, which provides funding for the projects and eagerly supports the students' research.



Elizabeth Neleski (Junior) and Brian Adams (KSU Graduate)
with a Universal Robots UR10

The various projects target repetitive tasks that are presently being done by people. All projects allow the mechatronics engineering students to apply concepts they've learned in their major courses. They also learn new skills, such as wiring and using software programs to run simulations, which students may have little to no experience with prior to working on the projects.

One of the robots that the students work with that they talked about extensively, the UR10, is a collaborative robot that works alongside human workers. It has sophisticated safety protocols that tell it to stop moving if it is touched unexpect-



**Dr. Matthew Marshall and students with Mohawk sponsors
Marietta Campus, March 2018**

edly, making it ideal for a manufacturing job. It is also easy to program; you can simply physically manipulate the robot to do something, and it learns to do the same thing repeatedly. The UR10 and other robots are used to automate jobs that are relatively simple so that humans can be used for other tasks that are more difficult to automate. The students say that a lot of people worry about automation taking jobs from humans, but they are enthusiastic about how automation can help by giving humans opportunities to move to better, less strenuous jobs since the repetitive tasks can be performed by robots instead.

There are other benefits to using robots for these jobs. As long as there are no outside problems (like something physically blocking them), robots can continue performing the tasks they are programmed to with greater consistency and fewer errors than humans. They are highly profitable because it costs less money to purchase and maintain a robot than to hire, train, and continue to pay a human employee. In the long-term, the demand for automation leads to more research and, ultimately, better technology and more ways to use that technology to help humankind.

Working with robots also presents unique challenges. One of the biggest, Dr. Marshall said, was the lab setup; he recalls having to move ceiling panels out of the way to get the large frames for the machines through the door. Students also talked about the challenges of the problem-solving processes they went through to figure out how to get the robots to perform the desired tasks. A lot of trial and error is involved; they could come up with a lot of ideas about how to address a problem and find that none of the initial ideas work. One student said that it is necessary to “adjust when you get new information; you’re not going to get it exactly right on your first try.”

IMPORTANT DATES!

Student Funding (URCA) Deadlines

The Office of Undergraduate Research is proud to sponsor [funds for undergraduate research](#). Students can apply for a maximum of \$700 to be used to offset costs associated with conference travel (e.g., registration, transportation) or to purchase supplies/materials associated with a research project. **Deadlines: 7/6/18, 10/5/18, 12/7/18, 2/1/19, and 5/3/19.**

National Conference on Undergraduate Research (NCUR) at Kennesaw State University

[NCUR](#) is the largest conference on undergraduate research in the country. The Office of Undergraduate Research will pay the registration fees for students accepted to the conference. **NCUR will be held at KSU April 11-13, 2019. Abstracts are due the first week in December, 2018.**

Faculty Funding (CARET) Deadline

This [funding program](#) is designed to encourage and support faculty engagement in research or creative activities with undergraduate student collaborators using a team approach. **Faculty can apply for up to \$8,000 in funding. Applications are due March 1, 2019.**

Upcoming Workshops

Students, are you interested in submitting an abstract to the National Conference on Undergraduate Research (NCUR)? The Office of Undergraduate Research will offer [workshops](#) on how to write a conference abstract: **10/9/18 and 11/28/18.** We also will hold workshops on how to apply for URCA funding: **9/28/18.**

Schedule a Class Visit

The Office of Undergraduate Research is pleased to offer classroom presentations to talk to students about undergraduate research and creative activity. These visits can range anywhere from 5 minutes to the entire class period. To request a presentation, please complete the short form [here](#).



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