

SOUTHERN ILLINOIS UNIVERSITY
EDWARDSVILLE



Fall 2017

Research & Creative Activities

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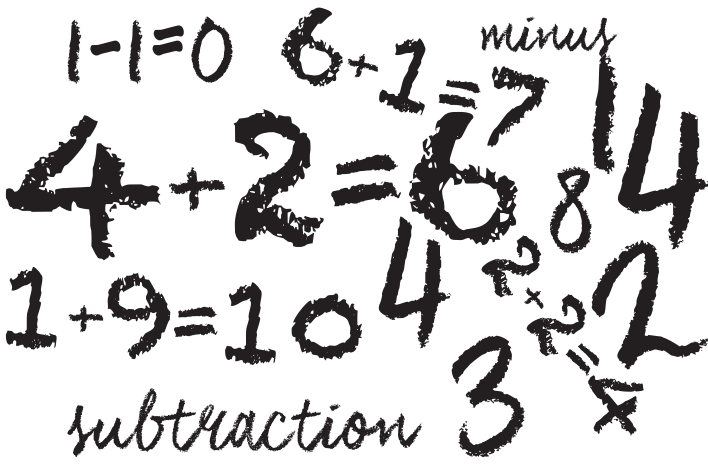
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Equipping Teachers to Improve Young Children’s Mathematical Thinking (on the cover)

With a \$200,000 multi-year grant from the Chicago Mercantile Exchange (CME) Group Foundation, an SIUE early childhood education faculty member is working to improve the foundational math skills of young children by developing the instructional effectiveness of early childhood educators. Read more on page 6.

Scholarship and Research Endowment

The SIUE Graduate School provides educational opportunities to nearly 2,500 students annually. The Graduate School is currently able to provide a few of these students with scholarship funding to succeed. Scholarships and research support allow students to pursue their educational interests based upon passion and excitement, and not debt concerns. It allows students the ability to focus on their studies rather than their bank statements and provides opportunities for students of exceptional acumen with limited means the opportunity to make a difference in life. As a commitment to our students’ pursuit of excellence, the SIUE Graduate School has launched a High-Impact Campaign to raise a minimum of \$100,000 to create a Scholarship and Research Endowment.

The Scholarship and Research Endowment creates a permanent and lasting source of support for our graduate students. It will provide a commitment to attract and retain the finest graduate students. Funding will be provided to outstanding students from across the University annually and will reward them for their academic excellence.

Give today: siue.edu/give

Dean’s Message



Procession of Characters from Shakespeare's Plays, circa 1840, Unsigned Painting: Yale Center for British Art

Creative Activities: The Critical Broader Impact of the Arts & Humanities

“Suit the action to the word, the word to the action; with this special observance, that you o’erstep not the modesty of nature: for anything so overdone is from the purpose of playing, whose end, both at the first and now, was and is, to hold, as ‘twere, the mirror up to nature; to show virtue her own feature, scorn her own image, and the very age and body of the time his form and pressure.” (Shakespeare, Hamlet, Act 3, scene 2, 17–24).

Prince Hamlet, in directing the actors of his play within the play, discloses the true purpose of the drama to go beyond mere entertainment to reflecting, as a mirror, to the King the morality of his actions, for “the play’s the thing wherein I’ll catch the conscience of the King” (Shakespeare, Hamlet, Act 2, scene 2, 604-605). Presumably, from the procession of his characters, Shakespeare is also revealing his own beliefs that the function of theater is to be a mirror that starkly reflects back to us truths of our own morality and humanity.

And that is the critical broader impact of the arts and humanities. Reflecting truths of who we are as people and as a society, shaping our morality and our humanity, at times subtlety, at other times cataclysmically. The power of this is seen in works such as Harriet Beecher Stowe’s Uncle Tom’s Cabin, in John Upton’s The Jungle, in Anne Frank’s The Diary of a Young Girl, in George Orwell’s Nineteen Eighty-four, and Ray Bradbury’s Fahrenheit 451.

Now, when the funding for the National Endowment for the Arts (NEA) and the National Endowment for the Humanities (NEH) is at question, it is worth revisiting President Johnson’s remarks as he signed the bill that created the NEA and NEH. “For it is in our works of art that we reveal to ourselves, and to others, the inner vision which guides us as a Nation. And where there is no vision, the people perish” (Lyndon B. Johnson, September 29, 1965). In the demise of the NEA and NEH we not only lose support for our artists and scholars, whose works shape our society and community’s vision, but also “we would lose the tangible, official, institutional evidence that the society represented by the United States government is one concerned not merely with commerce and power but with ideas and values”¹.

Included in this issue of Research and Creative Activities you will find a feature on some of our scholar’s works in the digital humanities. These include works of significance to our community like the Madison Historical: Online Encyclopedia and Digital Archive that brings together dozens of Madison County museums and archives for online public access. Also, the National Science Foundation funded Digital East St. Louis Project that is exploring the role of out-of-school learning in shaping student’s interests in science and technology while creating a unique online history of East St. Louis. These as well as the other projects featured in this issue highlight the value SIUE scholars bring to our region, our nation, and our world.

Jerry B. Weinberg

Jerry B. Weinberg, PhD
Associate Provost for Research and Dean of the Graduate School

References

1. David Hadju, “Who needs the NEA and the NEH”, The Nation; April 7, 2017; <https://www.thenation.com/article/who-needs-the-nea-and-neh/>

Selected Research Spotlights and News



\$300,000 Department of Justice Grant Supports Sexual Assault Prevention

The SIUE Office of Student Affairs received a \$300,000 Department of Justice grant through the Violence Against Women Act (VAWA). The grant will fund the SIUE Survivor Support Initiative to utilize education for prevention of sexual assault and increase student awareness of victims’ services.

Grant funding is being used to:

- Increase awareness of and access to prevention information and victims services
- Prevent incidence of sexual assault experienced by SIUE students
- Coordinate current and proposed efforts to respond to sexual assault committed toward SIUE students

In order to reach these goals, SIUE seeks to:

- Expand the already established sexual assault task force by including new community members
- Strengthen connections with Call For Help’s Sexual Assault Victim Care Unit
- Increase its involvement in prevention and awareness programming, policy development, and survivor support

A project coordinator will develop and implement sexual assault prevention and education programming on campus, as well as develop tailored trainings designed to meet the needs of underserved students (those with disabilities, international students, students who identify as LGBTQ and men) on campus. The project coordinator will also develop and oversee a peer mentoring and education program, using evidence-based methods to most effectively address sexual assault on campus.

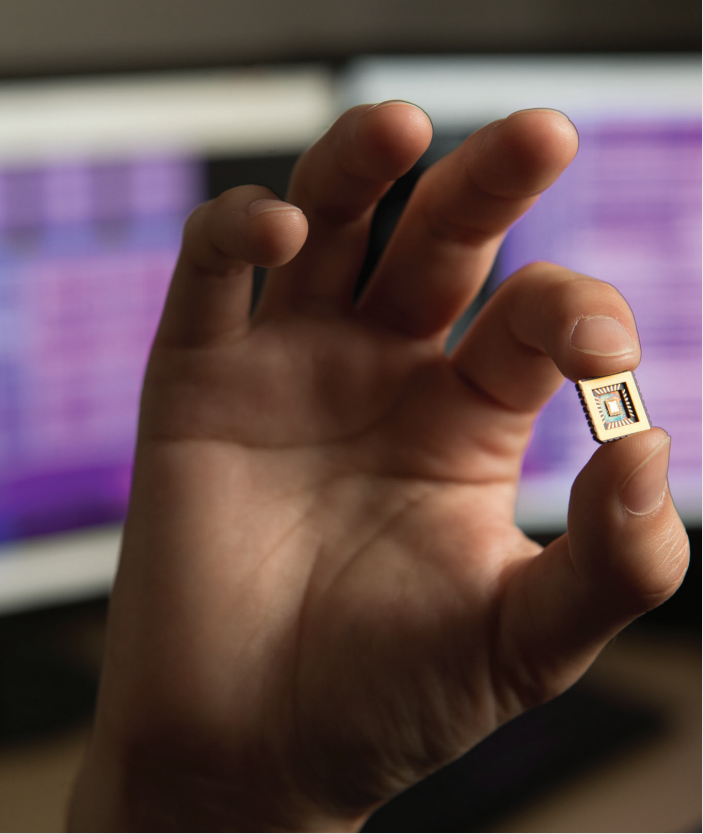
Private Donation Funds Research on Illinois Chorus Frogs

Richard Essner, PhD, associate professor in the Department of Biological Sciences in the College of Arts and Sciences, received \$10,000 in private funding to support his research on the Illinois Chorus Frog.

“Illinois Chorus Frogs are a state-threatened species whose population has declined sharply throughout its range, primarily due to habitat loss,” Essner said. “Historically, they were found at several locations in Madison County, including Granite City and South Roxana. These populations have disappeared due to development, leaving the population along the western edge of the SIUE campus as the only one remaining in Madison County.”

The goals of the research team include determining the location of the chorus frogs during the non-breeding season and identifying key travel corridors when they emerge to breed. This information will be vital in the conservation effort to protect the species.

The donation allows Essner and his research team to purchase radio transmitters that will be used to track the movements of the Illinois Chorus Frogs in order to identify critical habitat and inform their conservation efforts.



NSF MRI Grant Funds Instrument Development

The National Science Foundation (NSF) awarded SIUE a \$204,565 grant through its Major Research Instrumentation (MRI) program for a project under the direction of principal investigator George Engel, PhD, professor in the School of Engineering’s Department of Electrical and Computer Engineering.

The award supports Engel and his graduate students’ research involving the development of custom microchips that are used in experiments conducted by physicists from Washington University in St. Louis, Texas A&M, Florida State University and several other universities.

The integrated circuit design conducted in Engel’s research lab involves extremely detailed work that results in the creation of tiny, yet powerful, microchips that are approximately 5-by-7 millimeters in size. The chips are capable of replacing huge racks of electronics that used to be required to conduct these types of experiments.

“This is a two-year grant, consisting of three parts,” Engel explained. “We have promised to add features to two existing

chips that we previously created. One chip, able to identify the type of radiation being detected, can be potentially used in handheld radiation monitors for first responders. The second allows physicists to obtain extremely precise energy measurements. It can count as little as 3,000 electrons.

“Finally, we’re working on a new custom chip, designed to be used in conjunction with the aforementioned chip which can determine the type of radiation present.”

Fulbright U.S. Scholar Grant Takes Zhou to Brazil

Jianpeng Zhou, PhD, PE, professor in the Department of Civil Engineering in the School of Engineering, received a Fulbright U.S. Scholar grant, presented by the U.S. Department of State and the J. William Fulbright Foreign Scholarship Board.

Zhou traveled to Brazil to conduct and expand his research project entitled “Adaptive Green Infrastructure for Urban Water Management” at the Institute of Hydraulic Research of the Federal University of Rio Grande do Sul (UFRGS). UFRGS is one of the largest federal universities in Brazil, located in the city of Porto Alegre, with more than 27,000 undergraduate and 9,300 graduate students.

According to Zhou, Brazil is experiencing rapid urbanization and population growth, which has placed high demands on infrastructure and severe urban water management problems. Likewise, in the U.S., water infrastructures in many cities require the investment of billions of dollars to address their physical and environmental issues.

“Green infrastructure integrates storm water management with landscaping, offering a holistic approach to urban water problems,” he explained. “This project will develop a fundamental understanding about green infrastructure for storm water reduction. Shared learning and development of adaptive green infrastructure will benefit engineering applications in both the U.S. and Brazil.”



Suicide and Prevention: Creating Awareness, Recognition and Education

Preparing for exams, balancing work and school, managing finances, navigating relationships, and finding time for extracurricular activities ... college life is stressful. For many students, these stressors can quickly add up and become unbearable. Unfortunately, some see their situation as hopeless, and their thoughts turn to suicide.

More than 1,000 college students commit suicide annually, and the number is steadily increasing.

- **Suicide is the second-leading cause of death among young adults (ages 20-24)**
- **More teenagers and young adults die from suicide than from cancer, heart disease, AIDS, birth defects, stroke, pneumonia, influenza and chronic lung disease combined**

Source: Centers for Disease Control

In an effort to counteract these alarming facts, SIUE has strengthened its commitment to student safety and support through a project funded by a Campus Suicide Prevention Grant. The Substance Abuse and Mental Health Services Administration awarded the nearly \$300,000 grant to the SIUE Schools of Pharmacy and Nursing and SIUE Counseling Services to fund an initiative to Create Awareness, Recognition and Education (iCARE) about suicide and prevention.

“Suicidality, while not always present with depression, is a serious symptom that may go unnoticed if a student feels uncomfortable talking about mental health struggles or is not aware of their treatment options,” said Kelly Gable, PharmD, associate professor of pharmacy practice. “The goals of the iCARE initiative are not only to raise awareness on suicide prevention, but also teach students to empower each other to seek help when faced with depression or suicidal thoughts.”

Since implementation, iCARE has maintained a strong presence in the campus community. Several events were held during International Suicide Prevention Awareness Week in September 2016.

- An awareness video (siue.edu/icare-video) was launched to initiate dialogue around the topic. The video features members of the SIUE community promoting the shared goal of raising awareness regarding depression and suicide risk among college-age students and delivering a universal message that SIUE cares about the mental well-being of its students.
- Documentarian Lisa Klein visited SIUE for a rough cut showing of her documentary “The S Word” (theswordmovie.com). The film aims to reduce the stigma and expand the conversation about suicide. The documentary is a passion project for Klein, as her father and brother were both suicide victims.
- For one day, SIUE’s Stratton Quad was blanketed with 1,100 backpacks that displayed personal stories in memory or in honor of loved ones impacted by suicide, creating an emotional representation of the scope of the problem and the number of college students who die by suicide each year. “Send Silence Packing” was presented by Active Minds, the leading national nonprofit that empowers students to speak openly about mental health in order to educate others and to encourage seeking help.

Later in September, iCARE hosted the “Out of Darkness Walk” in The Gardens at SIUE, encouraging area community members, students, faculty and staff to walk in support of suicide prevention and mental illness awareness.

During National Random Acts of Kindness Week in February 2017, students had the chance to brighten another person’s day. Clothespins were available for students to decorate and adorn with inspirational messages. Students anonymously clipped their decorated pin on a stranger’s backpack as a surprise act of kindness.

iCARE invited students to complete “At-Risk for College Students,” an online role play simulation exercise. Through relatable scenarios, they learned how to better identify when someone they know is struggling with psychological issues, such as anxiety, depression, substance abuse and suicidal thoughts.

A faculty-development workshop, “Suicide Awareness and Prevention,” was led by Counseling Services staff, expert faculty and student advocates. The training was designed to help faculty members feel more comfortable and confident in their ability to respond to students in need.

“Our goal for these events was to empower student advocates and faculty members to learn more, ask questions and ultimately reduce stigma surrounding seeking help,” Gable said.

In the future, guest speakers will be invited to campus annually to lecture on suicide’s impact on families and loved ones, warning signs of suicide, and risk factors for self-harm. A Fresh Check Day,

held early in the fall 2017 semester, provided students, faculty, and staff an opportunity to engage in topics related to mental health wellness.

An executive council, comprised of faculty from the psychology department and the Schools of Pharmacy and Nursing, staff from Counseling Services and SIUE Police, students and community partners, has had oversight of the suicide prevention initiative. The council will ultimately transition to become a standing committee at SIUE. The function of the committee will be to advise the director of counseling and dean of students on policies, procedures, programmatic development and outreach pertaining to suicide prevention and crisis management.

College Students and Suicide

8% have suicidal thoughts

2.4% have a suicide plan

0.9% have attempted suicide

Source: Centers for Disease Control



Send Silence Packing

“As I walked across the quad the day of that powerful event, I saw pictures and stories of people like me,” said Madeline Douglas, junior in the School of Nursing. “They were full of potential, but they had come upon a time of hopelessness and struggle that they could not overcome.”

Douglas became inspired to learn how nurses could be better educated on suicide. Now, as a research assistant in the Undergraduate Research and Creative Activities (URCA) program, she is involved in many aspects of suicide assessment and prevention, including research for iCARE.

The URCA program allows undergraduate students from all disciplines to develop meaningful relationships with faculty mentors while gaining experience in the lab, field or studio.



iCARE is an aggressive, multi-tiered approach to:

- Increase awareness of and education about recognizing at-risk behaviors of students in crisis
- Improve campus policies and procedures for assisting these students
- Reduce negative stigmas of counseling and help-seeking for those in need
- Provide training to faculty, staff and students for recognizing when to intervene and get help for at-risk students

**Suicide Hotline
800-273-TALK**

Equipping Early Childhood Educators to Improve Mathematical Thinking

When it comes to learning, research shows that the first five years of life are the most important. Knowing this, Martha Latorre, PhD, associate professor of early childhood education in the School of Education, Health and Human Behavior, is working to improve early childhood teachers’ understanding and methods of teaching math.

A \$200,000 multi-year grant from the Chicago Mercantile Exchange (CME) Group Foundation is funding Latorre’s work to improve the foundational math skills of young children by developing the instructional effectiveness of early childhood educators. This is the first time the CME Group Foundation awarded a grant outside the city of Chicago. The grant required Latorre and Allison Fahsl, PhD, co-investigator from McKendree University, to first complete a course at the Erikson Institute, a renowned graduate school for childhood development in Chicago.

“The course enhanced our own knowledge of mathematics education,” Latorre said. “We began looking at math in different ways, not only from a memorization standpoint, but as a skill of understanding why things are the way they are.”

The colleagues then identified SIUE Head Start/Early Head Start and RiverBend Head Start to be the focus of the project. The first step was to gain a baseline understanding of what was happening in the classroom. They met with 51 teachers within these two organizations to discuss their educational background, their thoughts about teaching math and what materials were available to assist them.

“In our observations, we saw a lot of focus on simple identification of numbers, shapes and sorting, and counting, rather than how or why they were actually doing the math activities,” Latorre said.

Once teacher and classroom inventories were complete, two workshops were held to help teachers develop a firm understanding of concept development—the intentional and consistent use of strategies that encourage higher-level understanding and thinking skills. After each workshop, teachers received a materials catalog and funds to purchase math materials for their classrooms.

Follow-up classroom observations after the first workshop showed the teachers were still focusing on sorting and counting, versus how or why they were doing the math. The second workshop continued to focus on concept development and helping teachers think outside the box. This time, Latorre and Fahsl purchased the math materials for the teachers.

Participating teachers completed a Mathematics Teaching Efficacy and Beliefs Instrument (MTEBI) to track the change in their confidence regarding teaching math. Latorre is pleased with the results.

“We did a great job of stirring up their initial thoughts about teaching math,” she said. “We gave teachers a new dimension of meaning in mathematics. We opened their eyes to the math they should be doing.”

As the grant’s funding comes to a close, Latorre plans to use the remaining grant funds to continue the instructional growth of the teachers. She also wants to identify ways to get math materials into the children’s homes.

“This is a huge project, and it will need to be an ongoing process,” Latorre said. “Enhancing math education skills for early childhood educators can help enrich the rest of their teaching.”



Grants for Cutting-edge Chemistry Research Enrich Student Learning Experience

Committed to enhancing the student learning experience, SIUE chemistry faculty members are involving students in their federally funded research projects. Three faculty members in the SIUE Department of Chemistry received awards totaling nearly \$700,000 through the Research in Undergraduate Institution (RUI) program of the National Science Foundation (NSF).

The RUI program supports and strengthens research efforts and quality at predominantly undergraduate educational institutions like SIUE and promotes the integration of research and education in academic departments, a model SIUE exemplifies.

Cristina De Meo, PhD, professor; Leah O’Brien, PhD, distinguished research professor; and Chin-Chuan Wei, PhD, professor; are using RUI funding to advance their leading-edge research while also providing outstanding experiential learning opportunities for graduate and undergraduate students. The three projects involve 10 SIUE undergraduate students majoring in chemistry, biology and pre-professional medical studies, five SIUE chemistry graduate students, and one graduate student from University of Missouri-St. Louis.

De Meo encourages students in her lab to develop strong work ethics as they take on responsibilities and become independent learners.

“The RUI grant allows us to increase research productivity while better training our own students,” De Meo said. “I want students to develop the abilities to work as a team and learn new techniques and skills. I want them to feel motivation—even if they do not see themselves pursuing a career as scientists—because they have the desire to learn and make contributions to the field.”

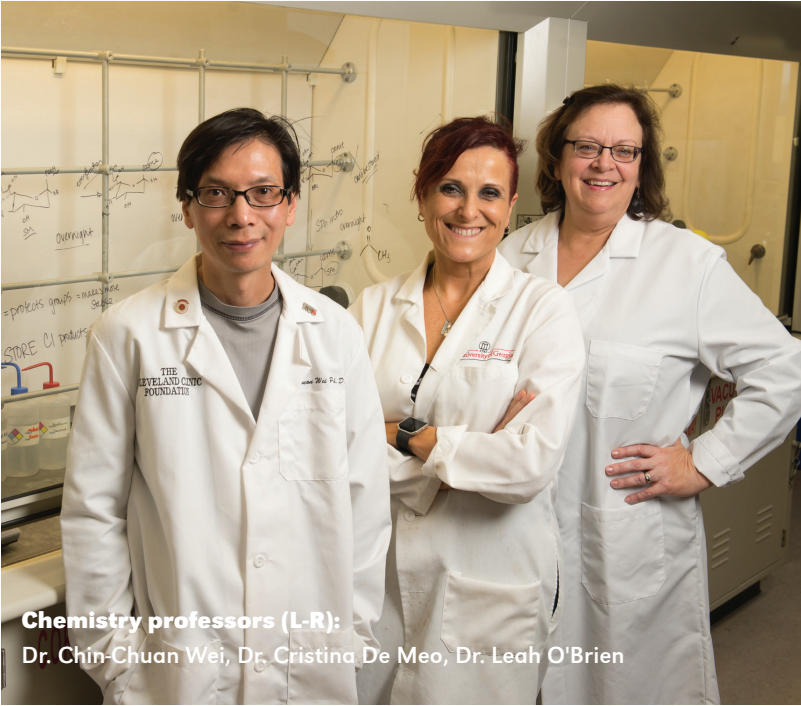
De Meo received nearly \$300,000 in funding for a project entitled “New Methods for Chemical Sialylation: An O-Protecting Group Approach.” Her research is focused on a process known as chemical sialylation, which allows the formation of important complex biological compounds called sialic acid-containing glycoconjugates. These compounds are involved in many normal and pathologic biological processes, including cell-cell adhesion, oncogenesis, metastasis, and attachment of viruses and bacteria to cells. De Meo is determining chemical synthesis methods for attaching sialic acid residues to other carbohydrates. De Meo’s students are gaining practical research experience that bridges the fields of organic chemistry and biomedical sciences, which may aid them in making career choices.

Wei received nearly \$214,000 from the NSF RUI program for his proposal “Domain-Domain and Protein-Protein Interactions in NADPH Oxidase 5 and Dual Oxidase.” His research uses biophysical techniques to study the catalytic properties of two calcium-dependent enzymes – NADPH oxidase 5 and dual oxidase. These two enzymes have high biomedical significance because their products, known as reactive oxygen species, are important in both cancer and cardiovascular disease. Wei is studying how these enzymes self-regulate their activity, with the goal of identifying the

molecular properties that give them distinct activity profiles. Students participating in this project have the opportunity to use a new instrument called a Nano2G isothermal titration calorimeter, which was purchased using a portion of the NSF funding. This instrument is also used in physical chemistry and biochemistry laboratory courses and has paved the way for a new integrative laboratory course in biophysical chemistry. The instrument is thus helping to maintain a top-notch chemistry curriculum for undergraduate and graduate students at SIUE in addition to helping produce cutting-edge research.

O’Brien received more than \$186,000 in funding for a project entitled “High Resolution Spectroscopic Studies of Ionic Metal-Ligand Bonds.” Her project investigates how metal and halogen atoms bind together to form molecules by developing an advanced technologic approach known as Intracavity Laser Absorption Spectroscopy with Fourier Transform Spectrometer Detection (ILS-FTS). O’Brien studies metal-containing diatomic radicals, molecules that are critical in catalyzing, or increasing the efficiency of, many chemical reactions important to both industry and medicine. The students in her laboratory get hands-on experience in using state-of-the-art spectroscopy equipment and analysis methods to probe important questions in chemistry while also preparing educationally to meet their goals for either additional education or entry into the scientific work force.

“These NSF grants have incredible impact on our faculty and students,” O’Brien said. “We are able to provide high-quality research experiences for our undergraduate and graduate students, buy new equipment, provide summer research stipends, present at conferences, and publish in top-tier journals. We have been able to grow our graduate program and increase both our stature in the chemistry community and the prestige of our campus nationwide.”



Chemistry professors (L-R):
Dr. Chin-Chuan Wei, Dr. Cristina De Meo, Dr. Leah O'Brien

Digital Scholarship at SIUE

The use of digital information is prevalent today. SIUE faculty members are leveraging this platform to bring local and national history alive for teachers, students and fellow scholars. Current projects include saving historical written and oral records from residents in East St. Louis and Madison County, as well as from Native Americans on the west coast. Their work is providing a basis for future scholarship and learning.

Philosophy Professor Uses Digital Scholarship to Help Preserve Indigenous Wisdom and Practice

For Gregory Fields, PhD, professor of philosophy, digital scholarship has been a critical component of his work for nearly 20 years. He took his research in the direction of digital scholarship in the late 1990s, before it was an established practice.

“Digital scholarship helps support the diversity and integrity of the languages, cultural traditions, and knowledge-systems of the world,” Fields said. “In the early years, it was an uphill battle. Editing software was not as accessible or user friendly as it is today.”

Thanks to the support of the University’s IRIS Center (Interdisciplinary Research and Informatics Scholarship), Fields has published three large projects concerning the Straits Salish of Washington State and British Columbia, a region of contemporary Indian America that was not well documented. Two additional projects are forthcoming, including a four-CD set from Smithsonian Folkways. Each publication contains a book or monograph along with an audio/visual component. “I was able to complete the work while my Native collaborators were living and able,” Fields said.

For Fields and other scholars who work in cooperation with various cultural groups, digital scholarship provides vastly expanded ways to collect, analyze, and share information and ideas for the creation, preservation and dissemination of knowledge concerning languages, thought and culture. For systems of knowledge that do not use text as a primary means of preserving and perpetuating that knowledge, the use of multimedia (integrated text and audio and video recordings) provides a more comprehensive account and, importantly, a presentation style that is more culturally appropriate than text would be by itself.

“There is no substitute for being in the presence of a living storyteller, singer or oral historian,” Fields said. “However, given the historical and continuing loss of indigenous knowledge and the loss of Native knowledge-bearers, audio and video provides one way for indigenous wisdom and practices to continue to help future generations.”

NSF Grant Funds “Digital East St. Louis” Project

Digital East St. Louis promotes interest in STEM education and digital humanities. Digital humanities use technologies to study questions related to history and culture. The project exposes middle school students in East St. Louis, Ill., to the digital humanities while nurturing community pride.

The three-year project is supported by an \$846,000 Innovative Technology Experiences for Students and Teachers (ITEST) grant awarded to SIUE from the National Science Foundation.

“This study is examining out-of-school learning and what role it can have in shaping students’ STEM interest, attitudes and educational choices,” said Sharon Locke, director of the SIUE Center for STEM Research, Education and Outreach and principal investigator for the grant.

SIUE faculty and staff in the STEM Center, Department of English Language and Literature, and Department of Historical Studies have worked with the students on a variety of projects, including:

- Digital walking tours: students photographed East St. Louis neighborhoods and parks and posted them in online maps
- Oral history interviews: students interviewed senior citizens and turned them into podcasts
- Documentary films: students researched the history of education, sports and music in East St. Louis and recorded and edited the videos
- Coding and web design: students built their own web pages

eaststlouisculture.org



Innovative Digital Archive Features History of Madison County

A new digital archive, *Madison Historical: The Online Encyclopedia and Digital Archive for Madison County, Ill.*, is transforming the historical experience, using 21st century technology to display 20th century history.

Madison Historical brings together nearly two dozen museums and archives in Madison County. Along with consuming the digital archive’s information, the public can become producers. Themes of government, industry, education, law and culture comprise the content areas in such forms as:

- encyclopedia articles on significant people, places and events in the county
- oral history interviews with people who played a role in shaping the history of the county
- photographs, letters and documents

Madison County Regional Superintendent of Schools Robert Daiber, EdD, noted the absence of a formally recorded history of the county since 1912. He called on the expertise of SIUE scholars and students to develop the digital archive. The project was developed and managed by Department of Historical Studies associate professors Jeffrey Manuel, PhD, and Jason Stacy, PhD, as well as Stephen Hansen, PhD, faculty emeritus and former interim chancellor, along with undergraduate and graduate students.

The team hopes the digital collections will foster public interest in visiting local museums and historical societies. The collection also serves as a valuable resource for local teachers and students, who can incorporate local history into their teaching and learning by using materials from the website.

According to Stacy, the students were at the core of the project, acting as a conduit to partner institutions for the creation of this hub of historical references. “The students were able to put the skills we teach them in class into practice in a way that gives back to the Madison County community,” he said.

Madison-Historical.siu.edu

Madison County, Illinois, Naturalization Records: A Digital Collection of Social and Family History

In the early 19th century, the circuit court in Edwardsville, Ill., was a common destination for people seeking citizenship. Madison County and the city of Edwardsville were established in 1812 and 1818, respectfully. South-to-north immigration and settlement patterns brought people to Edwardsville.

Today, a physical collection of Madison County, Ill., naturalization records is preserved in the Louisa H. Bowen University Archives and Special Collections, a unit of SIUE’s Library and Information Services, located in Lovejoy Library.

The collection, which includes more than 22,600 pages of naturalization records, holds unique information of importance to family history researchers and social historians. The earliest naturalization documents contain extensive information, such as the applicant’s name, age, country of birth, date of arrival in the U.S., port of arrival, and renunciation of previous national allegiance.

The fragile condition of these primary source materials significantly limits their accessibility. A grant of more than \$42,000 from the Illinois State Library, allowed Steve Kerber, PhD, university archivist and special collections librarian, to digitize the vast collection. Lora Smallman, humanities librarian; and Sarah Park, technology and engineering librarian; co-authored the grant and co-directed the digitization project.

“Naturalization records are essential to the study of state and local history,” Kerber said. “We hope the digitization of these records will encourage historians and researchers to conduct deeper historical research beyond genealogy.”

The digitized collection of naturalization records is expected to be accessible online in early 2018 and will be hosted by the Illinois Digital Archives of the Illinois State Library.



**Madison
Historical**
The Online Encyclopedia and Digital Archive
for Madison County, Illinois

Engineering Faculty Make Headway in Highway Safety

Snowdrifts, unexpected pedestrian crossings and wrong-way driving all contribute to the number of automobile accidents that occur each year, some of which result in fatalities. Several faculty members in the SIUE School of Engineering are making significant advances in various research projects to ensure that motorists and pedestrians alike can safely arrive at their destinations.

Reducing Automobile Accidents, Raising Environmental Sustainability through Living Snow Barriers

Yan Qi, PhD, assistant professor in the Department of Civil Engineering, in collaboration with faculty from Washington State University, is studying the design and placement of living snow fences, or natural barriers consisting of strategically planted shrubs, trees and prairie grasses as windbreaks, to prevent snow drifting on roadways.

Through the research, supported by a \$225,000 grant from the Illinois Center for Transportation, the team will design, employ and combine two- and three-dimensional computational fluid dynamic models. These methods, along with computer-aided design and drafting, 3D drawings, and site-specific analysis, will be used to simulate snow drifts. The models will then be calibrated using data collected by observing locations where snow barriers are currently in place.

After the models have been calibrated, they will be used to assess the effects of freeway interchange and roadway section geometries, including upwind ditch depth and other ground modification techniques. From there, the team will identify the proper design of living snow barriers.

Once the research is completed and the results are finalized, the team will make recommendations to the Illinois Department of Transportation (IDOT) regarding the implementation of these living snow barriers on snowdrift-prone freeway interchanges and highway segments.

The results are expected to provide longer-lasting, low-maintenance and cost-effective solutions to the problems that drifting snow causes, including nearly continuous plowing, and excessive use of chemicals or road closure.

“Living snow fences feature additional benefits in providing carbon sequestration, enhancing wildlife habitat, improving erosion control and water quality, and reducing flooding,” Qi said.

Adequate Guidelines and Deployments for Pedestrian Treatments

Pedestrians are considered the most vulnerable road users, and unfortunately, pedestrian-related incidents are on the rise. In 2014, more than 4,700 pedestrians were killed in the United States, an increase of six percent from 2011 and the highest number of fatalities in five years.

Qi, along with Ryan Fries, PhD, associate professor and chair of civil engineering, are working together to ensure pedestrian safety, which was declared an area of emphasis by IDOT. Research and resulting actions are of absolute necessity to reduce the number of pedestrian-related crashes and fatalities.

Funded by a \$76,000 grant from IDOT, Qi and Fries’ research project, titled “Establishing Procedures and Guidelines for Pedestrian Treatments at Uncontrolled Locations,” aims to foster more consistent selection and design of pedestrian safety countermeasures, reduce engineering costs, and improve pedestrian safety statewide.

The team will assess pedestrian-involved auto accidents in Illinois from local, regional and state-wide perspectives. Through thorough literary review of traditional and modern crosswalk technologies and safety measures, the team is developing recommendations on more effective pedestrian countermeasures, thus enhancing pedestrian safety at locations where vehicular traffic is not controlled (no stop signs or traffic signals) and reducing pedestrian-related accident rates. After the research is concluded, their final guidelines will ensure IDOT has improved pedestrian treatment selection, design and management practices specifically for Illinois.

“This guide will cover a wide range of pedestrian treatments or treatment combinations, incorporate the latest research results, and target the specific needs of Illinois,” Fries said. “These guidelines can be used by IDOT as well as other agencies in Illinois.”



School of Engineering faculty members (L-R):
Dr. Yan Qi, Mark Grinter, Dr. Albert Luo



Implementation of Wrong-way Rumble Strips Begins in Alabama

Albert C. J. Luo, PhD, distinguished research professor in the Department of Mechanical and Industrial Engineering, along with Huaguo Zhou from Auburn University, have worked for three years to develop new countermeasures for wrong-way driving. Their design uses directional rumble strips, which are the focus of the region’s Roadway Safety Institute on safety systems and high-risk road users.

The researchers went through an extensive literature review process to determine which rumble strip technology would work best to deter wrong-way driving. Field vibration testing, rumble strip mechanical modeling and conceptual design of directional rumble strips were completed during eight months of research in 2014.

After review by the Roadway Safety Institute, the researchers selected their best directional rumble strip designs. The team worked with National Center for Asphalt Technology staff at Auburn University to install the design on their test tracks and measure noise and vibration levels. Based on these results, the researchers developed a detailed design for the installation of three types of rumble strips.

Due to the project’s success in its early stages, directional rumble strips were installed on Alabama roads prior to the project installation deadline of October 2016.

The team is conducting field observations, including collecting sound and vibration data using testing vehicles, recording video to observe driver behavior changes when driving on the rumble strips, and measuring the overall performance of the three selected designs. Final recommendations will be based on design effectiveness, cost and maintenance requirements.

“Transportation engineers at state and local agencies can use the findings of this research to deploy this countermeasure to reduce wrong-way driving incidents and crashes on freeways,” Luo said.

Advancing a Treatment for Alzheimer’s Disease

Alzheimer’s disease is a devastating neurodegenerative disorder of the brain, which robs individuals of their memory and eventually their capacity for performing the necessary tasks of daily living. Alzheimer’s is not a part of normal aging but progresses over time. The degeneration of neurons in the brain eventually culminates in Alzheimer’s disease.

More than five million Americans currently are living with Alzheimer’s. By 2050, this number could rise as high as 16 million. The sixth leading cause of death in the U.S., Alzheimer’s kills more than breast cancer and prostate cancer combined, according to the Alzheimer’s Association.

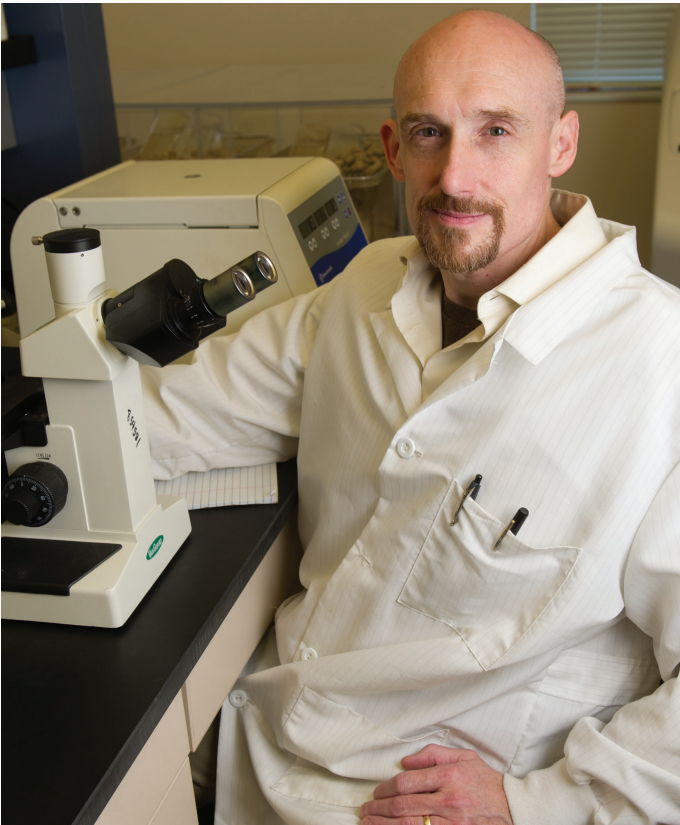
To date, Alzheimer’s has no cure and current medications have only short-term benefit. Without the development of better disease-modifying drugs, the financial, societal and emotional costs of this disease will continue to grow.

Focused efforts to combat this devastating disease are at the forefront of research in the SIUE School of Pharmacy. With a \$2.65 million RO1 grant from the National Institute of Aging, a division of the National Institutes of Health (NIH), Ken Witt, PhD, principal investigator and associate professor of pharmaceutical sciences, is leading a team of researchers composed of medicinal chemists, pharmacologists and pharmaceuticals experts to develop a drug for the treatment of Alzheimer’s. Initial investigations by the research team began more than 10 years ago.

“The NIH has placed a significant amount of responsibility in our hands. We have reached the critical point of developing, testing and retesting various drug candidates in a series of early stage models. Now, we can truly make things happen,” Witt said.

Using the process of lead optimization, Witt and his team are identifying and chemically modifying compounds with desirable characteristics for treatment of the disease. The goal is to target specific properties of the compound to increase the desired outcome—in this case, a rise in amyloid beta levels that can potentially enhance brain function related to learning and memory—while limiting side-effects to the patient.

“The high cost of drug discovery is often the result of the undesirable off-target effects that can force the whole project to be reset,” Witt said. “Our job is to optimize critical parameters early on in the process so that, by the time the drug is tested in human trials, there is a greater chance of success.”



Finding New Ways to Protect Dental Health



Dr. Nathalia Garcia, assistant professor and head of the periodontology section in the School of Dental Medicine, is partnering in the development of a novel personalized approach to protecting dental health.

Periodontitis, which is an inflammation of the gums that leads to tooth loss, is a major problem in the U.S. and worldwide. Data from the 2009-2012 National Health and Nutrition Examination Survey, conducted by the Center for Disease Control, found that 46 percent of U.S. adults over 30 years of age are afflicted with periodontal disease.

Periodontal disease progresses in random bursts at different sites in the mouth, which makes it challenging for dentists to determine the true progression of this condition. Garcia is working to find better ways for dentists to know whether patients are at risk of developing periodontal disease, if they require immediate treatment and if they are responding to treatment.

Garcia joined with research teams at the Forsyth Institute, New York University, the State University of New York at Buffalo, the University of North Carolina, Harvard University, and the University of Michigan to complete a study that was funded by the National Institute of Dental and Craniofacial Research.

The teams enlisted 500 patients with mild or severe periodontitis and 125 people without periodontitis. Garcia’s team recruited 60 participants. For each patient, the research team precisely measured the strength of tooth attachment and inflammatory substances around the teeth every two months for a year. Patients needing treatment began standard treatment for periodontal disease and were evaluated three and six months later to test whether the treatment was successful.

Clinical attachment lost (CAL) refers to weakening of the attachment of teeth in the mouth. CAL is the measure periodontists currently use to classify and evaluate progression of periodontal disease. However, in their study, Garcia and her colleagues found that defining disease progression as CAL was unsatisfactory.

They analyzed CAL measurements using a statistical method called linear mix models. This method allowed the researchers to identify periodontal sites with worsening disease and classify patients as progressing or stable after 12 months of monitoring changes in CAL. The team then investigated whether the initial CAL measurements could be used to predict periodontal disease progression in individual patients.

“Our more recent findings indicate that periodontal clinical parameters are poor risk predictors for periodontal disease progression,” Garcia said.

Garcia and her collaborators also analyzed the inflammatory substances around the teeth. In an initial group of 35 patients, they found eight substances that may distinguish worsening and stable periodontal disease. These biomarkers can potentially be used to identify areas that need treatment and to track how well these areas are responding to treatment.

This new information about the importance of biomarkers may help dentists more accurately decide which teeth show active periodontal disease and require treatment. This approach can also be applied to measure how well the patient is responding to treatment.

Through her research and the discovery of these diagnostic advances, Garcia is finding new ways to detect periodontal disease early and to aid people in maintaining healthy teeth and gums as they age.

Increasing Soybean Profitability through Image Calibration

For the past 20 years, soil sampling and yield monitors have been the foundations of spatial management in agriculture. The latest trend is to use high-resolution aerial imagery to develop vegetative indices, or crop health maps, to help growers and agronomists monitor crop conditions during the growing season and better identify stress factors within their fields.

The crop health maps, provided by commercially available remote sensing companies, offer a significant insight into spatial variability within fields, but they have some inherent limitations. These limitations lead to misuse and misunderstanding of the usefulness of these images in field management. This limitation is especially true when the maps are compared from one field to another or across time—both within a growing season as well as from one year to the next.

“One of the primary problems is in the lack of image calibration,” said Randy Pearson, PhD, professor of geography and director of the Laboratory for Applied Spatial Analysis at SIUE. “The information shown on a crop health map last summer cannot be compared to an image of the same field taken a year later or even the next day. So, farmers end up with a series of imagery that have just one-time use.”

The Iowa Soybean Association (ISA), an organization established by Iowa farmers to increase the profitability of soybean production in the state, posed two questions:

- Is the normalized difference vegetation index (NDVI), the most commonly used vegetation index, appropriate for the agricultural community?
- What is the reliability of vegetation indices such as NDVI if they are not computed from the calibrated digital data (converted from digital numbers into percent reflectance)?

They reached out to Pearson for answers.

“I couldn’t answer their questions, because everyone was producing the NDVI incorrectly,” Pearson said. “The numbers that came from the aircraft cameras had to be calibrated so we could look at any area and see how it was behaving over time. We needed to do some research and find the best way to

calibrate the data so the NVDI, the standard people are using, had real meaning.”

Broadly speaking, image calibration is the process of converting raw digital number (DNs) collected from an airborne imaging system into percent reflectance, a numeric value that is required for the computation of any true vegetation index.

In 2015, the ISA teamed up with Pearson and provided \$150,000 in funding to develop a plan to address their questions. A 190-acre calibration research site with multiple fields of both corn and soybean was identified. Calibration tarps with known percentage reflectance values were installed and images were collected every two weeks over the growing season. A team from Iowa State University (ISU) joined the effort a year later.

The site was used to test various imaging companies’ digital data to understand its potential for producing calibrated vegetation indices. Two companies participated the first year, and they produced 10 images. Pearson and SIUE geography master’s student Josh Pritsolas began looking at the data and noticed several problems.

“Their data was almost impossible to calibrate, so we started helping them,” Pearson said. Six calibration tarps ranging from three to 66 percent were purchased and placed at the calibration site. A computer algorithm was developed to transform all multispectral digital images (blue, green, red and near-infrared) into percent reflectance.

“Once we were satisfied with our calibration process, Josh developed a computer program that produced 11 different indices simultaneously,” Pearson said. “We are currently in the process of assessing those different indices. We’re now at the point that we can begin to answer ISA’s question: What’s the best vegetation index for agriculture?”

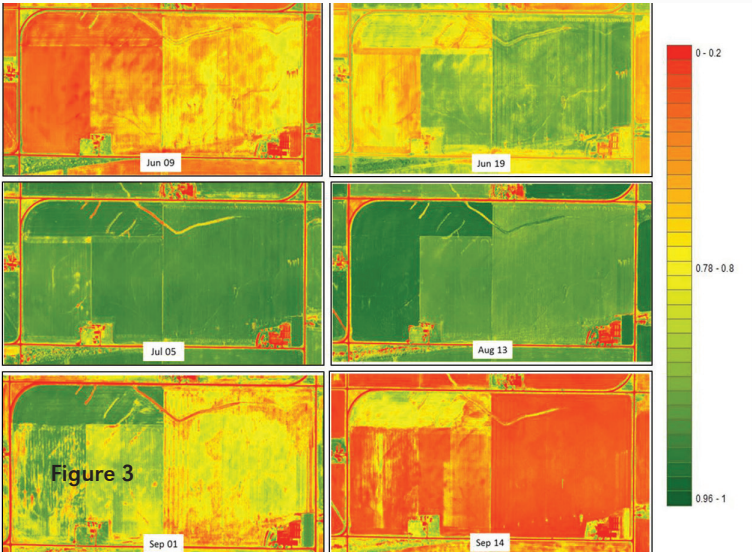
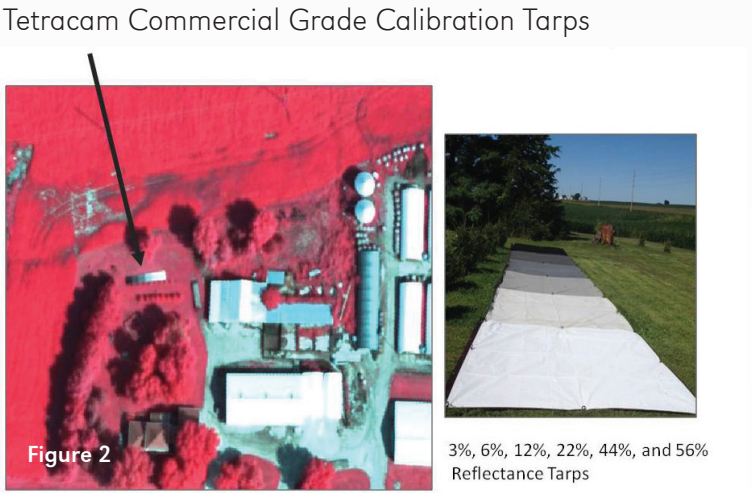
The value of collecting these images over time and calibrating them is significant. Pearson and Pritsolas are able to map things the farmer wouldn’t normally see with just one image. They can show the farmers on a week-to-week basis the good spots and bad spots in their fields, and track them so the growers can better identify the causes of variation within a given field. Is it pests, a lack of nutrients, a fungus or too much herbicide?

“The resulting vegetation index vector gives the grower a chronologic or temporal perspective on a point-by-point basis how a given area within the field arrived at its final yield,” Pearson said. “Two areas in a field may have the same final yield; however, they may have arrived at this yield through totally different paths. The use of multitemporal calibrated vegetation indices help the growers better understand the variation within an agricultural field and take appropriate action to minimize yield loss.

“Our goal is to develop a way of mapping fields into zones to help farmers manage their fields better.”

In the third year of collecting imagery, the research scope continues to expand. Additional funding has been secured from ISA, ISU is no longer involved, and five companies are flying and providing multispectral and thermal images. Pearson and Pritsolas have presented their research at the past two ISA annual conferences, as well as the International Conference on Precision Agriculture.

As of now, there is no end in sight for this project. “I believe we are leading the nation right now with our calibration efforts. We are getting a lot of notoriety and making significant inroads,” Pearson said. “The research site has become a test bed for different sensors. It is considered the standard, and imaging companies come fly the site to test the accuracy of their data.”



Selected Research Grants for Graduate Students Award Recipients

Each year, the SIUE Graduate School awards Research Grants for Graduate Students (RGGS). The purpose of the RGGS is to support research and creative activities initiated and conducted by SIUE graduate students to enhance their academic progress. Through the mentorship of faculty advisors, recipients typically work on projects related to their theses or final projects.

Gender Fluid Is Not Just for Teenagers

The difference between biological sex and gender remains commonly misunderstood. While some believe gender is assigned by birth and follows a binary structure, others recognize gender as a socially constructed view of males and females based on stereotypes and cultural norms. When an individual does not confine themselves to the set of gender norms or a specific sexual orientation, they are often referred to as gender fluid.

Recognizing that academic research has not been able to keep pace with gender fluidity, Kelli Zenner, a graduate student in the Department of Social Work, wanted to better understand what gender and sexuality mean to gender fluid individuals. While her study had a relatively low sample size (11 respondents), her data analysis found several common themes.

- The average age of respondents was 30, which was much higher than Zenner expected.
- Over half of the respondents have considered taking hormone therapy or transitioning to one gender identity.
- Participants realized their gender expression at an early age, but they did not begin to express their gender until an average of five years later.
- Participants discussed risk factors associated with their gender fluidity, such as mental health issues, discrimination and bullying, at both work and school.
- Participants discussed several positive impacts, including support from family and friends, spirituality, and group support.



The participants listed several things they want the general population to understand about gender fluid and non-binary identities. One particular response stood out to Zenner: “Society must be open minded and understand that not everyone needs to fill the requirements of a standard gender box.”

Zenner believes it is important for clinical professionals to be sensitive and aware of potential risk factors when working with the LGBTQ + population. She also believes additional research is necessary to understand various gender identities and inform the general population to create an inclusive environment.

Key Terms

- Biological sex:** Physiological assignment given at birth based on genitalia and chromosomes
- Gender:** Socially constructed view of male and female based on stereotypes and cultural norms
- Gender Expression:** How an individual chooses to express their gender
- Sexual orientation:** Sexual attraction to another individual
- Sexuality:** The action performed with another person
- Transgender:** An umbrella term that incorporates differences in gender identity wherein one's assigned biological sex does not match their felt identity

Source: American Psychological Association, 2011



Nigerian Women and Perinatal Loss

Death, grieving and the challenges associated with perinatal loss have no national boundaries. In Nigeria and other developing and third-world countries, women who experience perinatal loss, including miscarriage, stillbirth and infant death, face certain cultural stigmas following what is arguably one of the most traumatic experiences in their lives. However, the cultural silence, taboo and sensitivity that typifies death-related issues makes this topic under-researched.

Hoping to shed light on the challenges of Nigerian women who have suffered a perinatal loss, Adebanke Adebayo, a graduate student studying applied communications studies and English language and literature in the College of Arts and Sciences, traveled home to Nigeria. She spent four weeks conducting in-depth interviews with 35 women about their experiences with perinatal loss.

Adebayo reviewed the narratives with the purpose of understanding the challenges the women face, their underlying cultural beliefs and norms, and the effect perinatal loss had on their wellbeing. Following the thematic analysis of the extensive

interviews, Adebayo found multilayer ripple effects. Most significant is disenfranchised grief, which translates into identity loss, marital instability, negative body image and a feeling of despair. Not only did the women suffer medical side effects as a result of their loss, the psychological effects that accompany disenfranchised grief were strongly apparent.

According to Adebayo, these findings clearly show a need for open conversations that create culturally sensitive awareness among the indigenous people and healthcare professionals.

Improving Canine and Feline Diagnostic Techniques

Electrical engineering graduate students Rohini Dahal and Norsang Lama, both from Nepal, are combining the concepts of thermography, pattern recognition and software development to improve animals’ lives.

With the support of Scott Umbaugh, PhD, professor in the Department of Electrical and Computer Engineering, Dahal and Lama are developing a computer vision system software that uses images from infrared (IR) cameras to detect diseases such as canine bone cancer, canine anterior cruciate ligament rupture and feline hyperthyroidism.



Traditional medical imaging technologies such as radiography and MRI are less practical diagnosis options for veterinarians. Animals become uncooperative, and it is difficult for them to stand still for long periods of time. Imaging technologies are also expensive and time consuming, and they pose the risk of radiation exposure.

Knowing that thermography is noninvasive and doesn’t expose animals to harmful radiation, Dahal and Lama are working with Umbaugh to discover a way to use thermographic image analysis to detect pathologies in cats and dogs.

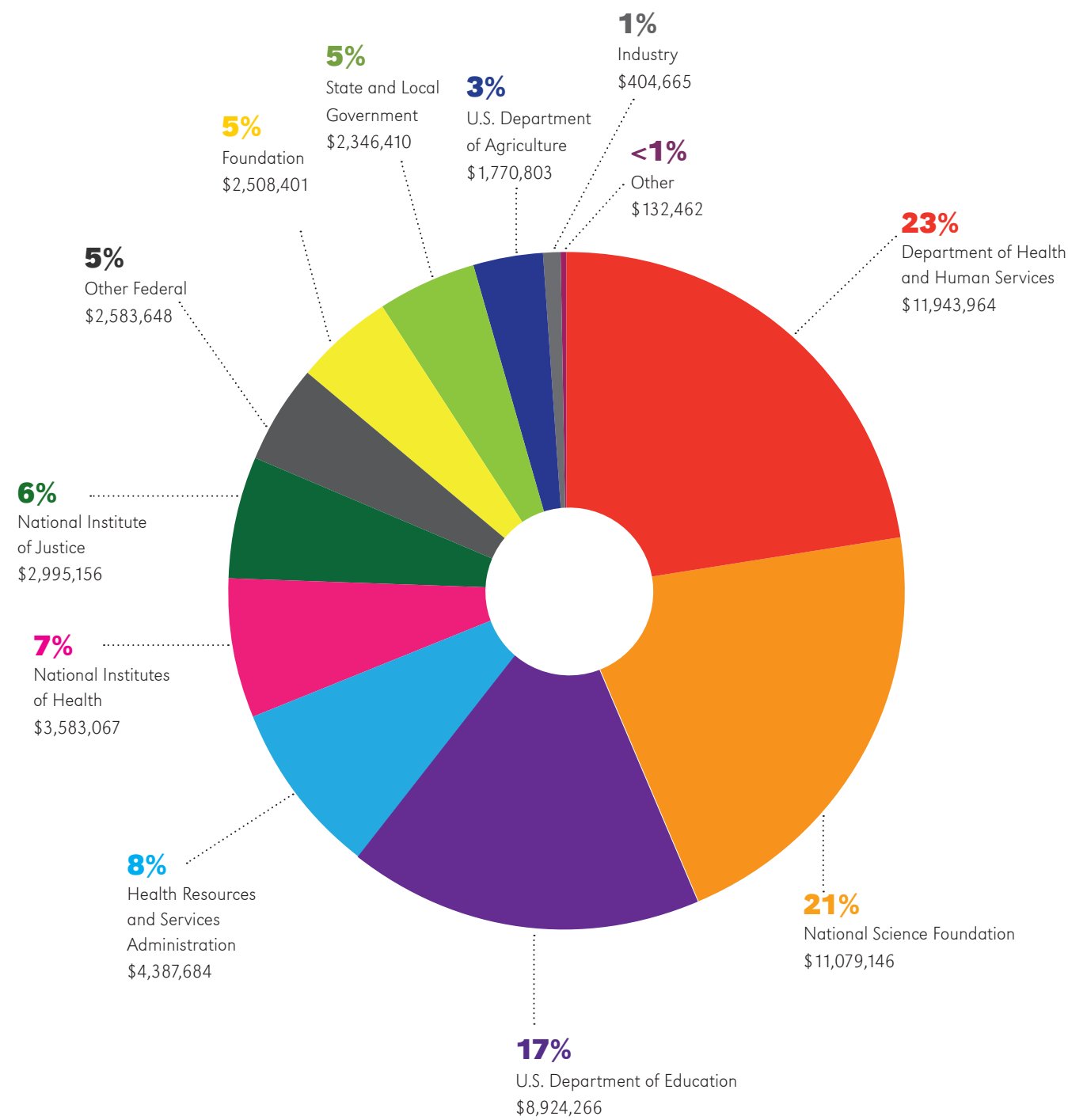
The resulting computer vision system software uses IR cameras to capture images of heat radiating from an animal’s body surface to detect certain diseases.

Lama developed thermal pattern recognition algorithms that correlates the body surface temperature with pathological conditions. His algorithms can detect and classify these pathologies with up to 90 percent accuracy. Dahal combined the new algorithms with existing ones to develop the computer vision system software. The software automates the manual prescreening process in veterinary clinics, dramatically reducing procedure time and sparing animals additional pain. The software captures a thermogram of the animal’s body parts and classifies the image for the presence or absence of a disease instantaneously.

Dahal and Lama have presented their work at the 2016 and 2017 International Society for Optics and Photonics conference. They are pleased with their results so far but continue to look for improvements. They are researching new diseases, and Lama is actively working to optimize the new algorithms to produce even better classification rates.

Externally Sponsored Projects

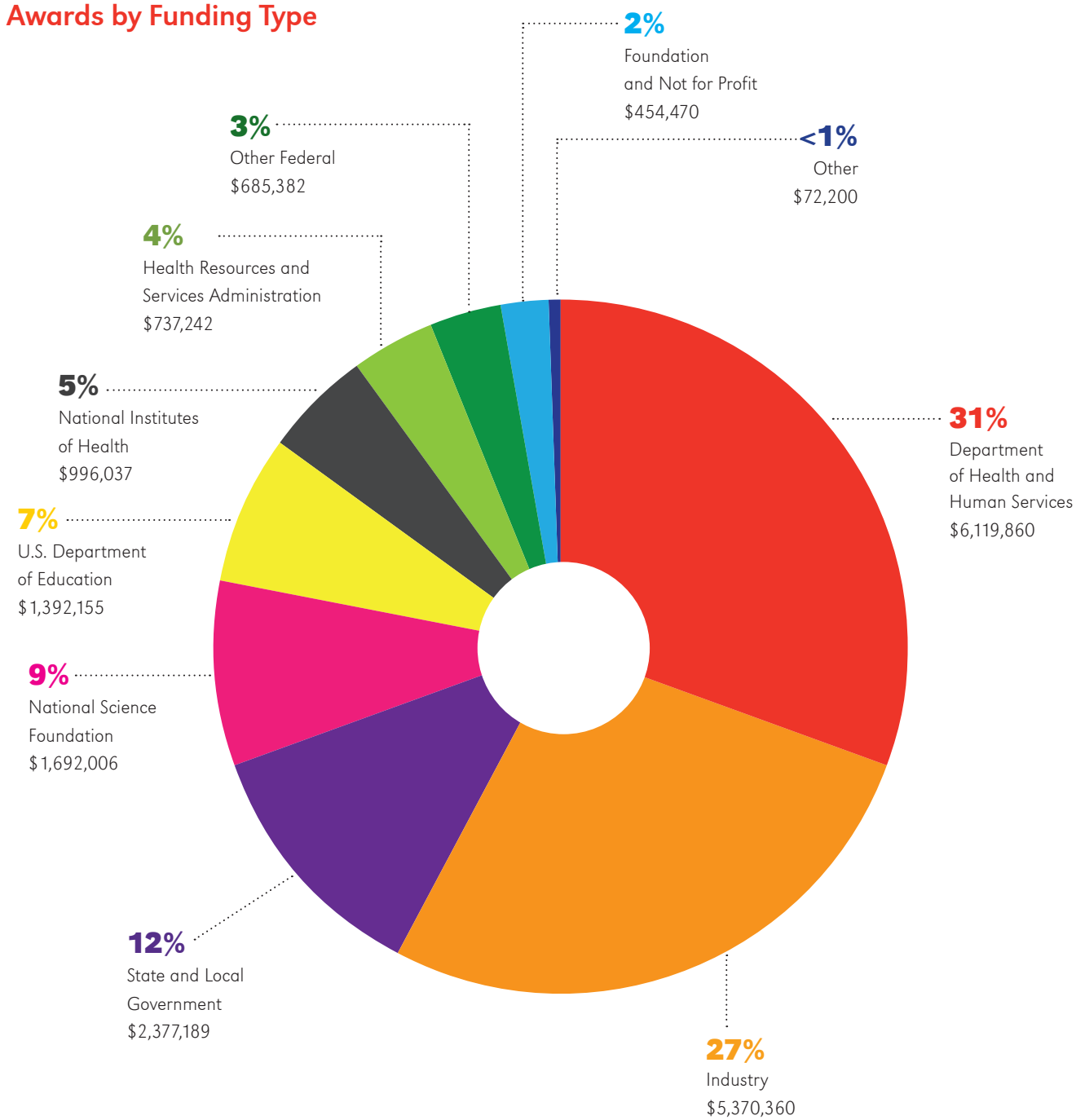
FY17 Proposal Submissions by Agency Type



91% of FY17 proposal funding* was submitted for federal funding

*by dollars

FY17 Awards by Funding Type



68% of FY17 award funding* was federally funded

*by dollars

Internal Grant Award Winners

SIUE Emeriti Strengthen Educational and Faculty Programming with Sponsorship

Founded in 2013, the SIUE Emeriti Faculty Association provides opportunities for retired faculty to remain active participants of the SIUE community. In addition to providing members access to the University, the group awards grant funding to select faculty projects aimed at strengthening the academic quality of programs and enhancing the University’s reputation.

The association’s yearly awards competition provides funding for a variety of projects that span across academic disciplines. This year’s awards will enhance the Departments of Historical Studies, Electrical and Computer Engineering, Mechanical and Industrial Engineering, and Computer Science.

Erik Alexander, PhD, Assistant Professor, Department of Historical Studies: \$2,500

Inaugural Abraham Lincoln Public Lecture: The first in a series of public lectures by prominent scholars focused on the theme of “Abraham Lincoln: Leadership, Democracy, and Freedom.”

John Klingensmith, PhD, Assistant Professor, Department of Electrical and Computer Engineering: \$2,200

The Enhancement of the Digital Signal Processing Course with Hardware Implementation of Digital Filters: Bring the course in line with current technology and enhance students’ skill set to respond to the evolving job market.

Nima Lotfi, PhD, Assistant Professor, Department of Mechanical and Industrial Engineering; and Gary Mayer, PhD, Assistant Professor, Department of Computer Science: \$4,000

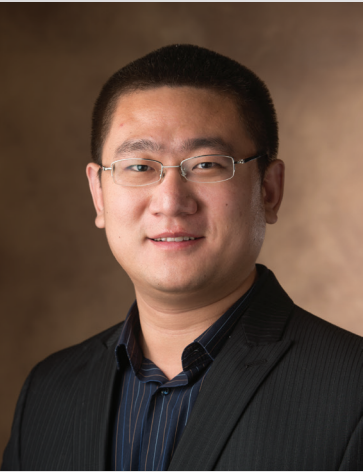
The Development of an Autonomous Robotic Platform for Improving Robotics Education in the School of Engineering: Addresses the growing need for engineers with a solid background in mobile robotics.

Jason Stacy, PhD, Associate Professor, Department of Historical Studies; and Jeff Manuel, PhD, Associate Professor, Department of Historical Studies: \$2,855

Madison Historical: The Online Encyclopedia and Digital Archive of Madison County, Illinois: Inform the local community about the history of Madison County, provide an accessible resource for students, genealogists and interested citizens, and create a framework for the documentation of local history by providing a digital collection of historically significant documents.

“The SIUE Emeriti Faculty Association sustains the teacher-scholar ideal through support of the growth and development of the current faculty. Just as the emeriti faculty helped build SIUE into an excellent institution, they are continuing their commitment to excellence by supporting the endeavors of the current faculty.”

Stephen Hansen, PhD, Professor Emeritus, Department of Historical Studies



Vaughnie Lindsay New Investigator Award

This award is presented to junior faculty members to recognize and support individual programs of research or creative activities that have the promise of making significant contributions to their field of study and to SIUE in general.

Xin Wang, PhD, Assistant Professor, Department of Electrical and Computer Engineering

Wang’s research project, “Ushering in the Smart and Autonomous Power Converters for Utility Power Grid,” proposes an innovative method of designing power converters, which will keep the power grid stable even when power is coming from solar, wind and other forms of distributed power generation resources that directly connect to the grid through a converter. According to Wang, as more renewable energy sources supply electrical power to the utility grid, there is an emerging trend of deploying smart and autonomous power converters, which is one of the best ways to maintain a stable power grid. He hopes that his proposed method will provide a better solution for the next generation power grid.

Competitive Graduate Awardees

Mauryne Kihuriri Abwao, Mass Communications
Tammy Banning, Social Work
Allison Bischoff, Industrial-Organizational Psychology
Laura Boville, Teaching English as a Second Language
Jessee Crane, Art
Alyssa Golike, Art Therapy
Kay Guyer, Art Therapy
Md Nahid Hasan, Mechanical Engineering
Molly Josephs, Kinesiology
Kassandra Karssen, Biological Sciences
Luke Lack, Public Administration
McKenzi McClain, Applied Communication Studies
Amanda Mortimer, Accountancy
MD Monjur Ellahi Rafi, Electrical Engineering
David Seidel, Biological Sciences
Ajim Uddin, Economics and Finance
Britney Walker, Social Work
Daniel Wescovich, English and American Literature
Olana Yadessa, Biological Sciences

Research Grants for Graduate Students Awardees

Christopher, Becker, Educational Leadership
Daniel Selvakumar Raja, Mechanical/Industrial Engineering
Dustin Fouch, Educational Leadership
Uzoamaka Nwosu, Nursing
Azadeh Akahavan Bloorchian, Civil Engineering

Research Grants for Research Doctoral Students Awardees

Adebanke Adebayo, Applied Communication Studies
Michael Allen, History
Kayla Bartz, Psychology
Rohini Dahal, Electrical Engineering
Srinivas Dasari, Civil Engineering
Jared Deputy, Environmental Sciences
Vu Do, Business Administration
Carly Faye, Art Studio
Leah Gallant-McFall, Art Studio
Anna Glushko, Psychology
Jessica Harvey, Psychology
Jacob Kaiser, Biological Sciences

Candace Karnish, Biological Sciences
Kassandra Karssen, Biological Sciences
Bahareh Kazemi Zahrani, Mechanical Engineering
Lyndzee Kent, Psychology
Niloufar Khojandi, Biological Sciences
Megan Klann, Psychology
Norsang Lama, Electrical Engineering
Caitlin McDonald, Art Studio
Eric Ntiamoah, Environmental Sciences
Kehinde Olagunju, Environmental Sciences
Oladoyin Oluaderounmu, Biological Sciences
Audie Perniciaro, Biological Sciences
Paniz Rahmani, Chemistry
Savanna Reeves, Biological Sciences
Mariel Schroeder, Teaching English as a Second Language
Samantha Sorrick, Biological Sciences
Rachel Sullivan, Biological Sciences
Krista Akers, Industrial-Organizational Psychology
Jaydn Alexander, Art Therapy Counseling
Dzifa Amengor, Biological Sciences
Stephanie Bauer, Industrial-Organizational Psychology
Jenna Belgard, School Psychology
Tyler Burk, Environmental Sciences
Mohamed Chakir, Teaching English as a Second Language
Susan Easton, School Psychology
Megan Gilbert, College Student Personnel Administration
Aditya Giri, Civil/Structural Engineering
Jeffrey Iverson, Chemistry
Daniel Karcher, Biological Sciences
Kevin Letterly, Environmental Sciences
Krystina Mueller, Industrial-Organizational Psychology
Alyssa Nanninga, Environmental Sciences
Allison Newton, Biological Sciences
Chima Okalanwa, Environmental Sciences
Quincy Phipps, Art Therapy Counseling
Kevin Ponder, Industrial-Organizational Psychology
Nicole Pontious, Learning, Culture, and Society
Nilofar Raeofy, Chemistry
Anthony Ramuglia, Chemistry
Emily Rardin, Industrial-Organizational Psychology
Nasim Salimraftar, Chemistry
Brandon Schack, Biological Sciences
Natalie Schleper, Chemistry
David Seidel, Biological Sciences
Toria Trost, Biological Sciences

Internal Grant Award Winners

Paul Simon Outstanding Teacher-Scholar Award

This award recognizes a faculty member for being an outstanding teacher and researcher and for demonstrating the belief that to be a good teacher, one must also be a good scholar. Winners have shown significant contributions to original research or creative activities and have successfully integrated those contributions into their teaching and mentoring practices.



**Kristine Hildebrandt, PhD, Professor,
Department of English Language and Literature**

Since beginning her tenure at SIUE in 2008, Hildebrandt’s grant activities have resulted in more than \$497,000 in externally funded grants and \$51,000 in internal grants. She received SIUE’s first National Science Foundation (NSF) CAREER Award, which is both highly competitive and prestigious. Hildebrandt is currently leading two NSF sponsored collaborative research teams. In addition to an extensive list of publications, conference presentations and research projects, Hildebrandt co-founded and co-directs the Interdisciplinary Research and Informatics Scholarship (IRIS) Center. Since its launch in 2010, she has mentored through the Center more than 12 undergraduates and six graduate students. Her emphasis on the teacher-scholar philosophy and the power of collaboration has been spread to her students, who believe their voices are valued and heard throughout the course of their studies.

Concept Commercialization Award

This award promotes interest in and involvement with intellectual property development and commercialization in order to benefit the health, safety and welfare of the community and the economic welfare of the University. The award is primarily intended for patentable inventions or discoveries but can also support trade secrets and copyrighted materials.



**Brad Noble, PhD, Associate Professor,
Department of Electrical and Computer Engineering**

**Mike Shaw, PhD, Distinguished Research Professor,
Department of Chemistry** (pictured on pg. 23)

The duo received a patent (U.S. Patent Serial No. 13/371,230 issued as patent no. 8845870) in 2014 for their Digital Potentiostat Circuit and System. The ‘no frills’ design emphasized electrochemical and spectroelectrochemical methodology for teaching environments. The circuit was designed to minimize cost yet still deliver high-quality data for a limited range of functions suitable for the teaching lab. The basic concepts that can be demonstrated with this device are relevant to studying batteries, fuel cells and solar cells. The award provides \$15,000 to assist in the marketing of their potentiostat.

Annette and Henry Baich Award

This award is given annually to the most outstanding Seed Grant for Transitional and Exploratory Projects proposal for basic research conducted within the parameters of the Sigma Xi Society. Disciplines include the physical sciences, life and medical sciences, earth science, engineering, psychology, and mathematics.



**Corey Ragsdale, PhD, Assistant Professor,
Department of Anthropology**

Ragsdale’s proposal seeks to address the question of how group membership relates to inequality in access to resources, labor distribution and violence for Colonial Mexico City. Ragsdale more broadly aims for his project to understand the biological consequences of socio-cultural changes associated with the Spanish colonization of Mexico and the American Southwest. He feels this project will lead to a better understanding of the effects of Spanish colonization on the demography of indigenous populations in North America.

Distinguished Research Professor

This academic rank is awarded to faculty members in recognition of outstanding and sustained contributions to research and creative activities as a result of their continued commitment to scholarship beyond the period of their promotion to professor. Recognition is only awarded to nominees demonstrating superior merit. Award recipients are recognized with the rank of “SIUE Distinguished Professor” for the duration of their tenure at SIUE.



**Mike Shaw, PhD,
Professor, Department
of Chemistry**

Shaw’s research contributions are in the areas of exploring metal-mediated transformations, developing experimental data collection methods, developing and curating strategies for data collection in the electrochemical field, and devising programs for data analysis. His impressive publication and product output includes 32 peer-refereed

journal articles and two patents. Shaw has also received funding as principal investigator or co-principal investigator on six National Science Foundation grants totaling more than \$2.15 million in funding, with just over \$1.4 million to SIUE to enrich the student research environment. Whether in theory, methodology or applications in chemistry, the acclaimed researcher’s contributions to his field are notable. Equally noticed by colleagues is his inspiring dedication to collaboration and the teacher-scholar philosophy.



**Bill Retzlaff, PhD,
Professor, Department
of Biological Sciences**

Retzlaff has made outstanding and sustained contributions to green infrastructure and sustainability in the areas of green roof and wall research, including storm water runoff retention and quality, thermal performance, plant survival, and maintenance techniques. Since his work on green roofs began in 2004, his research

has generated 10 externally funded projects, 114 oral/poster presentations, 11 peer-reviewed publications, 12 peer-reviewed conference proceedings papers and seven other publications. In 2014, he received the Sustainability Leadership Award from the SIUE Center for Sustainability and Spirituality. He also received the Green Roof and Wall Research Award of Excellence from CITIES ALIVE in 2015. Importantly, Retzlaff shows a distinct enthusiasm to continuously involve students in his research.

Visualizing Research Impacts

The SIUE Graduate School’s Visualizing Research Impacts (VRI) competition offers SIUE faculty, staff and students an opportunity to share the results and impact of SIUE research and creative activities through imagery.

Fifteen entries were received from faculty and students that depicted a wonderfully rich diversity of creative activities across the institution from the sciences, engineering, arts, humanities and education. Award winners received a \$1,500 monetary prize to fund their continued research or creative activities.

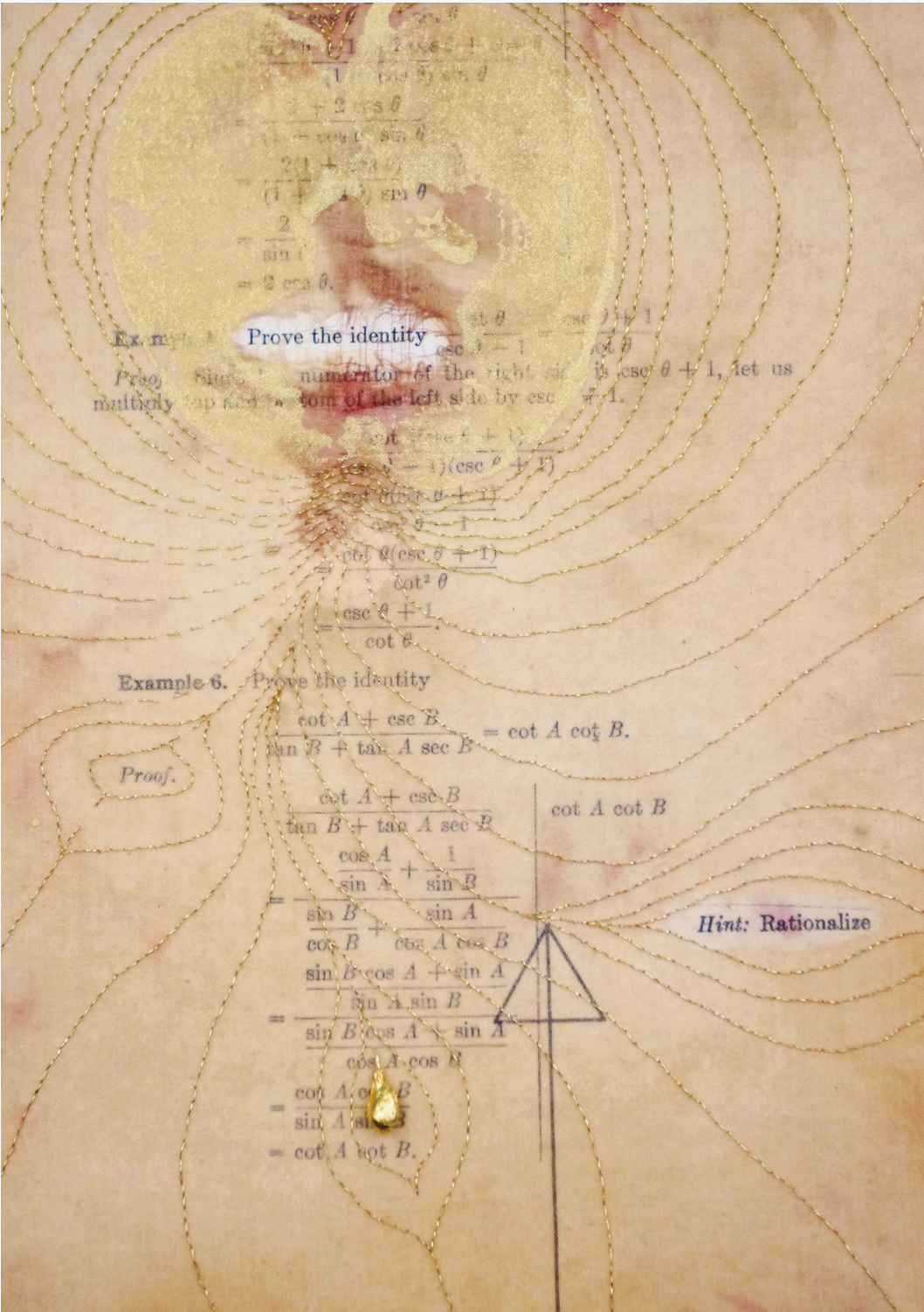
Most Creative Representation of Research Impact

“Identity”

Erin Vigneau-Dimick, Collection Manager, The University Museum; Lecturer, Department of Art and Design

Vigneau-Dimick’s piece, from her series entitled “Proof,” concerns the tensions between the language of math and logic and the textile (feminine) arts. There exists a stereotypical notion that women are considered “not logical” or “not good at math.” In vast contrast, Vigneau-Dimick argues that the highly-skilled women who work with intricate textile forms, such as crochet, knitting, weaving and lacemaking, are in fact highly mathematical, using elementary and higher math orders to extrapolate patterns and build designs.

“As I became involved with these collages, I researched theoretical ideas about language and logic and was struck by the sense of absolutism and certainty, principles that are not always borne out of life,” Vigneau-Dimick’s submission statement detailed. “Ultimately, I sought to create juxtapositions and open up an inquiry into the nature of language and its power to command and control, formalizing and reinforcing systems of hierarchy and suppression.”



Best Representation of Research Impact

Project New Direction

Jeremy Jewell, PhD, Professor, Department of Psychology

Howard Ash, University Photographer, University Marketing and Communications

Since 2009, Jewell has collaborated with the Madison County Problem Solving Courts to evaluate and help improve drug court services for their clients. The Madison County Drug Court provides drug treatment as an alternative to imprisonment. It was established in 1996 and was the first such drug court in Illinois. Heroin overdose deaths have more than doubled from 2012-2015 in Madison County, underscoring the critical need for such services.

Jewell and his colleagues published a recent study in the International Journal of Mental Health and Addiction reviewing the effectiveness of Madison County’s drug court program, reviewing data from 2006-2011, and found numerous indicators of success for its graduates.

“Graduates of the program were three times less likely to reoffend a year after discharge compared to those who did not participate in the program,” Jewell outlined in his submission statement. “Graduates also had 3-4 times fewer criminal incidents two years after discharge, and when they did reoffend, their offenses were less serious.”



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No similar interdisciplinary programs are offered in the St. Louis metropolitan region. The closest comparable program is more than 75 miles from SIUE.

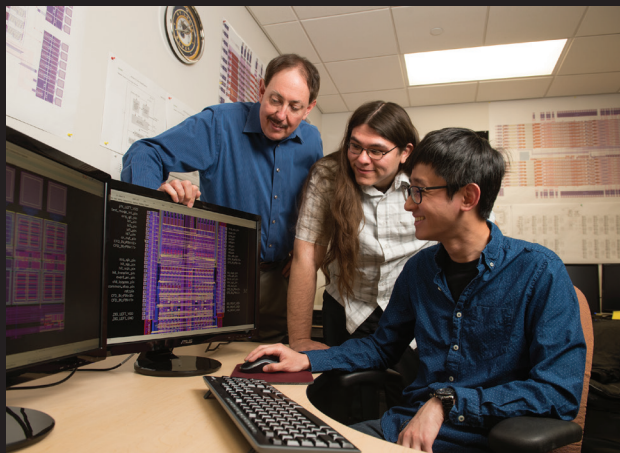
Students have created programs such as cultural education advocacy, engineering management and sustainability.

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