



# I O R

## IMAGE OF RESEARCH

2025 IMAGE OF RESEARCH  
Union Art Gallery, March 17 to 28

The Image of Research competition gives students the opportunity to engage creatively with their research, share behind-the-scenes views of their research processes, or portray their academic study in visual form.



MISSISSIPPI STATE UNIVERSITY™  
THE GRADUATE SCHOOL



## THE EMBODIMENT OF MOVING INTO FREEDOM

I took this picture of the national slavery monument in Amsterdam, the night before the commemoration and celebration of Keti Koti (the abolition of slavery in Suriname and the Dutch Caribbean). I was in Oosterpark with my friends to capture the monument where we would be seated across from the very next day during the national commemoration ceremony. The people sculpted by Surinamese artist Erwin de Vries, represent the moving from enslavement into freedom. As a Black Surinamese Dutch woman, who studies the group identity formation of Black Surinamese people in the Netherlands, I experienced my physical closeness to a representation of the past, present, and future of my people as a powerful reminder that we are the embodiment of the past. With my research I explore lived experiences that demonstrate that embodiment, so we can use what was left behind for us to continue to move into freedom.

**Name: Ashley Melcherts**

**Level: PhD**

**Department: Sociology**



## CAPTURING THE BREATH OF FIELDS: EDDY COVARIANCE AND GHG MONITORING

Imagine a farm not just as a source of food but as a dynamic exchange hub between the land and atmosphere. Our research harnesses eddy covariance towers, acting as silent sentinels, continuously measuring the “breath” of agricultural fields—tracking CO<sub>2</sub>, water vapor, and methane fluxes in real-time. By integrating AI-driven analytics, we unveil the hidden patterns of carbon sequestration, soil respiration, and climate-smart farming practices. Field maintenance becomes a fusion of technology and precision, ensuring sensors remain optimally calibrated amidst changing seasons. From automated soil probes, we transform conventional monitoring into a living laboratory, advancing sustainability in modern agriculture. This work bridges science and practice, empowering farmers with real-time insights to optimize productivity while mitigating climate impacts—one data point at a time.


**Name: Abhishek Panchadi**  
**Level: PhD**  
**Department: Plant and Soil Sciences**



## THRIVING AGAINST THE ODDS: RASPBERRIES IN MISSISSIPPI

Raspberries are not naturally suited for Mississippi's hot and humid climate, making their successful cultivation a challenge. Yet, some heat-tolerant cultivars are proving that resilience is possible. My research focuses on identifying these adaptable varieties, analyzing their growth, fruit yield, and ability to withstand environmental stress. This image captures more than just a plant; it tells a story of survival and adaptation. The butterfly resting on the berries is a reminder that success in agriculture isn't just about the crop—it's about the entire ecosystem that sustains it. Pollinators like this butterfly play a crucial role in fruit development, underscoring the delicate balance between nature and cultivation. By studying heat-tolerant raspberry cultivars, my research contributes to expanding fruit production in non-traditional climates while highlighting the ecological interactions essential for successful cultivation. Just like these raspberries, progress thrives in places once thought impossible.

**Name:** Apphia Santy  
**Level:** Master's  
**Department:** Plant and Soil  
Scienc



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## DON'T ROCK THE BOAT! IMAGE BASED MORPHOMETRIC ANALYSIS OF FISHES

Larval and juvenile fishes are notoriously understudied and monitored in comparison to their larger adult counterparts. This is largely in part because they are difficult to accurately weigh and measure in field-based settings. Rocking boats and wind can cause high precision scales to be significantly inaccurate. To circumnavigate the need for weighing, I am exploring and developing image based morphometric analysis techniques to assess body condition in native juvenile fishes. Image based analysis methods could easily be implemented in most existing sampling programs by using smartphone cameras and freely available software. This could potentially eliminate the need for taking tedious weight measurements in the field and in turn allow fisheries managers to more easily monitor and assess juvenile fish populations.

**Name: Camren Fraser**  
**Level: Master's**  
**Department: Wildlife, Fisheries, and Aquaculture**



## WATER'S BALLET ON MODIFIED CELLULOSE

Water's Ballet on Modified Cellulose" captures a fascinating scientific breakthrough where water droplets perform an elegant "dance" on paper, rather than being absorbed as you might expect. Just as ballet dancers maintain perfect balance and form, this tiny 10-microliter water droplet holds its spherical shape atop specially modified paper fibers. The paper, transformed through a simple metal-ion treatment, defies its natural tendency to absorb water. This environmentally friendly innovation opens doors to creating water-resistant paper products without harmful chemicals, supporting the global push toward sustainable alternatives to plastic.

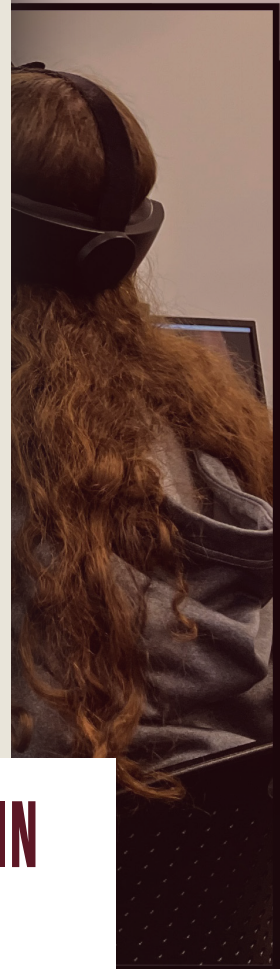
**Name:** Chathuri Peiris  
**Level:** PhD  
**Department:** Chemistry



## FROM ASHES TO ABUNDANCE: THE POWER OF FIRE IN CONSERVATION

Prescribed burning isn't destruction—it's renewal. In the Conservation Reserve Program (CRP), fire is not the enemy but an ally, mimicking nature's way of resetting ecosystems. This controlled blaze clears invasive species, replenishes soil nutrients, and awakens native plant life, fostering a thriving habitat for quail, butterflies, and other wildlife. When executed strategically, prescribed burns reduce the risk of catastrophic wildfires while enhancing recreational access and long-term land health. Yet, many landowners we interacted with in our study struggle with the complexities of fire management. That's one reason we developed the CRP Menu Tool—to bridge knowledge gaps, simplify conservation practices, and ensure landowners can harness the power of fire by knowing when and what requires burning. A well-managed burn today secures the resilience of tomorrow's landscapes. Sometimes, the land doesn't just need protection—it needs to burn to flourish.

**Name:** Daniel Egerson  
**Level:** PhD  
**Department:** Wildlife,  
Fisheries, and  
Aquaculture



## NOT JUST STUDIED, BUT LIVED: THE POWER OF VR IN LEARNING

My research is to build and explore Virtual Reality (VR) labs that make learning experiential. VR is reshaping education, it allows students to explore, interact, analyze, apply, and collaborate beyond classroom walls. During a VR Lab on atmospheric moisture, students explored an immersive rainforest, where weather conditions unfolded before their eyes. Students said, "It is possible to go to different locations because you can directly see how different environments factor into weather events." "There's something amazing about being able to experience entirely new environments that may never be accessible..." Arrows moved through the air, tracing the journey of water molecules as they evaporated from leaves and soil, rising into the atmosphere. "Watching the water molecules move while heat transfer was explained made it so much clearer especially sensible and latent heat, which was difficult to grasp before." Here, learning wasn't just studied—it was lived.

**Name:** Grace Olaitan  
**Level:** PhD  
**Department:** Industrial Technology, Instructional Systems, and Community College Leadership





## INVESTIGATION OF VOLUNTEERS' EMPOWERMENT IN AN ADAPTED SWIM PROGRAM

The image was taken during the Fall 2024 MSU Adapted Swim Camp, where volunteers teach water safety and swimming skills to individuals with intellectual disabilities. Volunteers play a vital role in sustaining such adapted sport programs, which rely heavily on volunteer involvement. Our qualitative research project aims to enhance the volunteer experience at the adapted swim camp. We investigate how volunteering in the adapted swim camp empowers volunteers and how this feeling of empowerment influences volunteers' decision to return for future camps. Following IRB approval, we utilized several data collection methods: one in-depth interview with each volunteer, observations of the swim sessions, and field notes to capture volunteers' experiences.

**Name:** Iuliia Kizner  
**Level:** PhD  
**Department:** Kinesiology



## FRAMING THE PAST: THE ART OF ARCHITECTURAL STORYTELLING

This image, taken in Verona, Italy, during a “Brands of Italy” study abroad marketing course, captures more than a historic view—it represents how architecture frames narratives that connect people to place. My research explores how historic entities have used art and design to brand themselves, inspiring historic preservation. Just as businesses craft identities to engage consumers, historic spaces tell visual stories that foster emotional investment. The layered textures of this medieval brickwork serve as a metaphor for these enduring narratives—each mark and material choice reflecting centuries of craftsmanship, identity, and cultural memory. By studying how these spaces have historically communicated their legacy, I aim to uncover creative marketing strategies that historic sites can use today to remain relevant and protected. Through preservation marketing, we can translate the silent stories of architecture into compelling calls to action, ensuring these spaces endure for generations to come.

**Name:** Jennifer Burt  
**Level:** Master's  
**Department:** Historic Preservation



## BLACK SKIMMER FORAGING

The Black Skimmer (*Rynchops niger*) has long fascinated many people because of its unusual foraging behavior of skimming the water's surface to capture fish prey. This seabird species is common in many coastal areas of the U.S., but is of conservation concern. Because Black Skimmers often forage at night and can fly several kilometers to forage, some basic aspects of their foraging ecology remain poorly known. On the Mississippi Gulf Coast, identifying important areas for Black Skimmers is a research need that would inform coastal restoration and conservation efforts. My dissertation research is a collaboration with the bird conservation nonprofit Audubon Delta. We are tracking the movements of Black Skimmers in Mississippi using global positioning system transmitters to shed light on these topics. I took this photo of a foraging Black Skimmer at Ship Island, Mississippi during my field research last summer.

**Name:** Jacob Wessels  
**Level:** PhD  
**Department:** Wildlife,  
Fisheries, and Aquaculture



## FISHING FOR DNA ON TOWN CREEK

If you ask most Mississippi anglers if they have caught any walleye recently, they will probably look confused. This toothy fish used to swim throughout the Tombigbee and Pearl River systems in the Magnolia State, but modern humans have severely altered these habitats by building dams and converting the surrounding watersheds into cities and farmland. Today, Mississippi walleye have become so rare that they have likely disappeared from many of their native streams. My research utilizes eDNA, a technology that allows us to detect fish based on trace amounts of their DNA in water samples. By sampling streams like the one in this photo for walleye DNA, I hope to identify areas where the species is still present. Walking along these riverbanks, I can imagine how wild and remote they must have once been. I hope that my research will help to restore a unique piece of this ecosystem.

**Name:** Kevin Jones  
**Level:** Master's  
**Department:** Wildlife, Fisheries,  
and Aquaculture



## FROM MY SKETCHBOOK: PIAZZA DEL POPOLO, ROME

The “genius loci”, or spirit of place, is a concept often discussed in Historic Preservation. Discovering, establishing, and communicating this sense of place fuels many an adaptive reuse, restoration or preservation project; it is essential to preserving that which is worth preservation. Throughout my degree program, I have searched for ways to combine my undergraduate education in studio art and art history with the problems of preservation. I have always kept a travel sketchbook. This drawing was done on location in Rome last August. Drawing grand examples of that which we are taught in class offers an incomparable layer to any curriculum and follows a long tradition in architecture curricula, preservation trades, and is currently popularized as the trend “urban sketching.” My research attempts to investigate the mechanics of how observational drawing functions as a primary tool in a preservationist’s education and research and how it might be amplified.

**Name:** Katherine Nave  
Kemalyan  
**Level:** Master’s  
**Department:** Historic  
Preservation



## HEALTHY ANIMALS, SUSTAINABLE FARMING: A FUTURE BUILT ON RESEARCH

Nestled in the warmth of their mother's embrace, these two goat kids embody the essence of health and harmony. This peaceful moment reflects the foundation of our work: sustainable livestock management. We focus on parasite control strategies that promote animal health and a more resilient ecosystem. Through research, we explore natural resistance and grazing techniques that limit parasite burdens, improving overall productivity. Healthier goats mean stronger herds, increased milk and meat production, and greater economic stability for farmers and their communities. Every small step towards sustainable solutions contributes to a future where farming is both productive and environmentally responsible. These sleeping kids remind us why our work matters—because healthy animals build thriving farms.

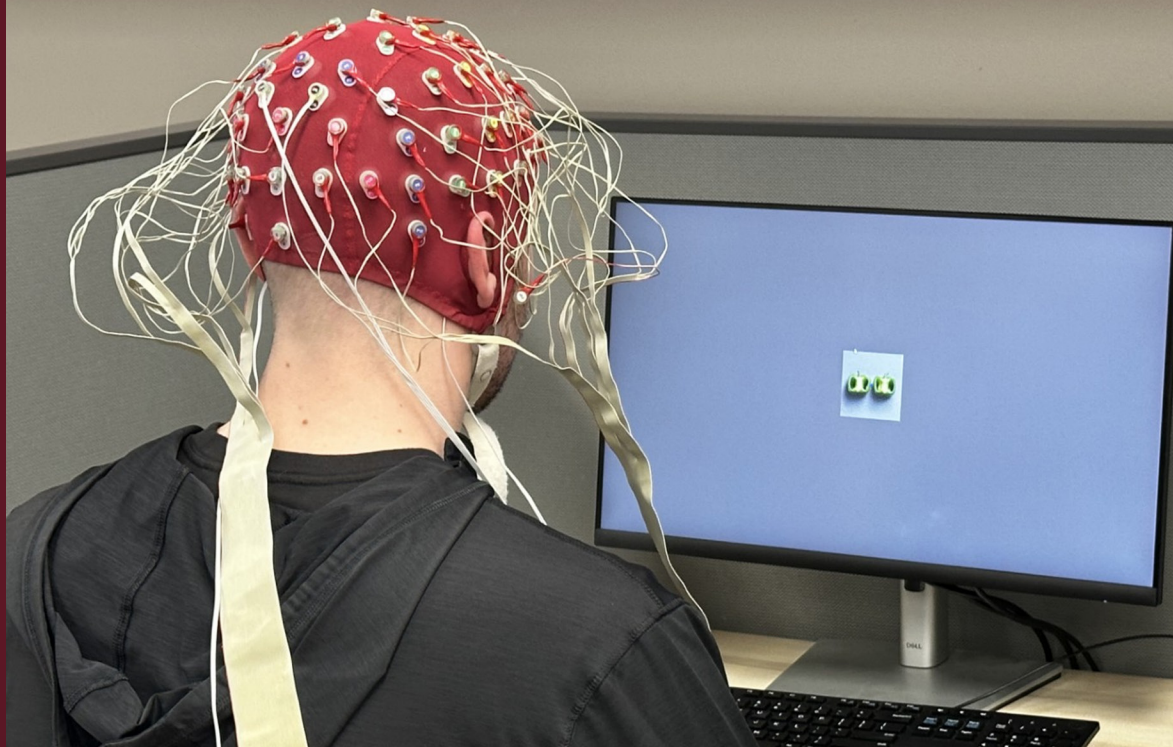
**Name:** Larry Leon  
**Level:** PhD  
**Department:** Animal and Dairy Sciences



## THE FACES OF THE MISSING

The phenomenon of going missing has become a prominent issue across the globe in the last several decades. Between 2023 and 2024, 890 people were reported missing in Mississippi according to the Mississippi Repository for Missing and Unidentified Persons, a clearinghouse for missing persons information throughout MS. My research aids in the geospatial analysis of the distribution and demographics of missing persons and the identification of possible risk factors contributing to who goes missing. The individuals pictured — many of whom have been missing for several years — are not just numbers; each has their own story deserving awareness, acknowledgment, and remembrance. Each individual has a story that illuminates the lived reality of those who go missing, informing researchers, like myself, and law enforcement agencies of patterns related to “missingness”, hopefully aiding in improved recovery rates and identification of missing and unidentified individuals, as well as the eventual prevention of missing persons.

**Name: Sarajane Smith**  
**Level: Master's**  
**Department:**  
**Anthropology and Middle**  
**Eastern Cultures**



## MENTAL HEALTH AND THE BRAIN: AN EEG STUDY

In this EEG study, I am exploring how the brain processes information by comparing two cognitive responses. The first response, semantic categorization, occurs subconsciously as the brain uses its prior knowledge to quickly categorize different objects, otherwise known as “top-down” processing. (i.e. a fruit or a vegetable) In contrast, the second response involves color detection, a low-level cognitive response that relies primarily on immediate incoming sensory information, otherwise known as “bottom-up” processing. By comparing these responses, I aim to determine whether a person leans more towards top-down or bottom-up processing. Understanding this balance may shed light on predispositions to conditions like ADHD or Anxiety, as an imbalance in processing could lead to these conditions. Ultimately, I hope to reveal how different processing methods are linked to mental health, opening doors for new and innovative treatments.

**Name:** Zack Murphy  
**Level:** Master's  
**Department:** Agricultural and  
Biological Engineering