



# IGNITE

ST. THOMAS AQUINAS COLLEGE

## **10<sup>th</sup> ANNUAL ART, DESIGN & SCHOLARSHIP EXHIBITION**



## **Ignite your curiosity. Ignite your imagination.**

Welcome to Ignite, St. Thomas Aquinas College's Tenth Annual Art, Design, and Scholarship Exhibition. Ignite is a celebration of our undergraduate and graduate students, their original research, and their creativity from multiple disciplines across campus. The scope of the presentations featured showcase the outstanding caliber of the students at St. Thomas Aquinas College. We hope that this exhibition will ignite the passion for discovery and ingenuity in all of our students for years to come.

The projects on display also demonstrate the ongoing commitment of our faculty in supporting undergraduate research. As is true of the faculty advisors who support them, these students and their work hold the potential to contribute positively to the world. Each of these students has benefited from mentoring provided by exceptional faculty. We thank the faculty for their efforts on behalf of these students.

We encourage you to share in this showcase as you visit the poster presentations and portfolios, and read the collection of abstracts included in this program and at [stac.edu/ignite](http://stac.edu/ignite).

Organized and curated by

Members of the Ignite Committee:

Prof. Nina Bellisio, Ms. Kimberly Burns, Dr. Meghan DeWitt, Dr. Pamerla Derfus, Dr. Staci Shultz, Dr. Tracy Tully, Dr. K. Emma Emanuel, and Dr. Richard Heath

Special thank you to Annie Lombardi and the Office of Campus Communications

# **IGNITE: 10<sup>th</sup> ANNUAL ART, DESIGN & SCHOLARSHIP EXHIBITION**

**April 24, 2025**

## **The Effects of Riparian Vegetation on Erosion, Chemical Composition, and Amphibian Biodiversity at Sparkill Creek in New York**

Presenter: Ciara Durcan

Faculty Advisor: Dr. Bianca Wentzell, Associate Professor of Biology

Riparian vegetation plays a crucial role in maintaining the health of stream ecosystems by acting as a natural buffer, filtering runoff, and providing diverse habitats for aquatic and terrestrial organisms. This study examines the short-term effects of riparian vegetation establishment along a small tributary in Sparkill, New York. Historically, the Sparkill Creek has been subjected to significant pollution, particularly since World War II, when the largest U.S. embarkation camp was built at its headwaters. Restoration efforts, including the New York State Department of Environmental Conservation's Trees for Tribs program, have aimed to mitigate these impacts. In October 2024, 290 trees and shrubs were planted along the creek to restore its riparian zone. Data on pH, dissolved oxygen, temperature, conductivity, amphibian populations, and vegetation growth were collected before and after the planting to assess the chemical and biological responses to restoration. Amphibian surveys provided insight into changes in the faunal community, while water quality measurements evaluated the creek's chemical health. Data collection will continue through May 2025, offering valuable insights into the role of riparian vegetation in improving the ecological integrity of small, impacted tributaries like the Sparkill Creek. This study highlights the importance of riparian restoration in supporting stream health and biodiversity.

## **The Death of the GOP: How the Southern Strategy Created A New Republican Party 1968-1980**

Presenter: John Cording

Faculty Advisor: Dr. Stacy Sewell, Professor of History

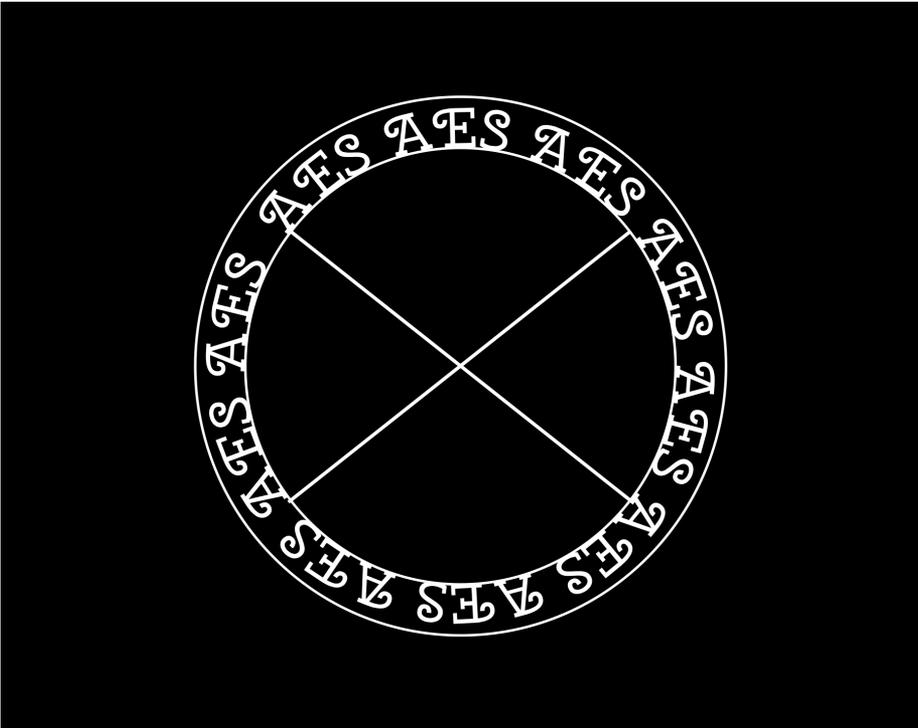
The modern Republican Party is not the same party that was created in 1854 to end slavery. In terms of ideology, especially in regards to race, it is more similar to the Pro-Confederate Democrats of the 1850's. My research aims to understand when and how this change in ideology occurred, and what this change resulted in. This change is the result of what is known as the Southern Strategy. The Southern Strategy was the way Republicans lobbied the Deep South in order to gain southern voter support. This strategy was pioneered by the actions of three individuals: George Wallace, Kevin Phillips and Richard Nixon. Through identifying the success of Wallace in the Deep South, Phillips was able to craft a strategy that, through Nixon, would ensure the Republican Party would maintain control over the Deep South. While many scholars agree that the Southern Strategy had an impact on American politics in the 1970's, they neglect the fact that the Southern Strategy continues to play an active role in modern Republicanism and American Politics at large. By identifying how the Southern Strategy was created, my research hopes to educate Americans on the true history of the modern Republican Party. As the United States continues to evolve politically it is prudent that the Southern Strategy is not forgotten. The Southern Strategy was not a long lost practice of a forgotten era, it is actively being used today and it will continue to be highly influential in shaping American politics.

## **Brand Perception in the Age of Generative AI: Analyzing Consumer Attitudes towards Nike and Heinz**

Presenters: Darryl Williams and Sebastian Cherry

Faculty Advisor: Dr. Deirdre-Noel Engels, Associate Professor of Marketing

The rise of artificial intelligence (AI) is reshaping how brands create and deliver visual advertising. This study examines the impact of AI-generated images and videos on consumer attitudes and brand perception, using ads from Heinz and Nike. We compared consumer responses to AI-generated versus traditional ads from each brand, with survey participants evaluating them on established attitude and brand metrics. The findings offer insights into how AI-generated content influences consumer perceptions and inform future advertising strategies involving AI.



**Personal Branding**

Presenter: Andrew Elizah Simon

Faculty Advisor: Nina Bellisio

## **Green Alternatives for Ketone Reduction**

Presenters: Angela Durinda and Richard Blacka

Faculty Advisor: Dr. Steve Burns, Professor of Chemistry

In mammals ketones (predominantly acetoacetate and 3- beta-hydroxybutyrate) are metabolized using alcohol dehydrogenase and NADH (Nicotinamide adenine dinucleotide) to produce alcohols as their primary metabolites. These enzymes are found predominantly in the liver and are used to metabolize alcohol as well. We can use the reductive properties of these enzymes in commercial processes as well. Industrially, ketones are reduced using sodium borohydride or lithium aluminum hydride but these processes can be costly, dangerous, and environmentally hazardous. A more environmentally friendly alternative to this would be to use carrots and sweet potatoes as a source of NADH. These root vegetables also contain high amounts of NADH for energy production which aids in photosynthesis. The biggest upside to this greener method is that no boron or aluminum salts are produced during the process so dealing with waste products is not as costly and is much easier. Our goal is to compare the yields of this method to industrial standards and see if there are any differences and if this can be scaled up enough to be a practical alternative.

## **2025 International Business Ethics and Sustainability Case Competition**

### **Team: Cooling AI: The Hidden Cost of Water**

Presenters: Ella Call, Patrick Phelan, Kanya Ramakrishnan; Eliana Raposo and Frank Schaeffer

Faculty Advisor: Christine Cahill Esq., Professor of Business Administration

In recent years, artificial intelligence (AI) technologies have expanded at an unprecedented rate, bringing with them significant ethical and sustainability concerns. One pressing issue is the immense water consumption required to cool AI data centers. On average, these facilities use approximately 300,000 gallons of water per day—equivalent to the daily consumption of around 100,000 households. Projections indicate that AI-driven water usage will reach 6.6 billion cubic meters by 2027. This growing demand is especially alarming given that nearly two-thirds of the global population experience severe water shortages for at least one month each year. By 2030, this crisis is expected to escalate, with nearly half of the world's population facing severe water stress—an issue exacerbated by AI's increasing water footprint.

Addressing this crisis is imperative. Companies at the forefront of AI development must take proactive measures to minimize water consumption and ensure sustainable access to this vital resource. To address this challenge,

we propose a solution that minimizes water consumption without sacrificing performance. Our challenge is to serve as business consultants and complete a plan that includes an analysis of the ethical, sustainable, legal and financial aspects of a problem, and a viable solution on all fronts. Our findings were presented at the 2025 International Business Ethics and Sustainability Case Competition in Los Angeles, where we competed against 20 international and domestic colleges and universities.

## **The Effects of Combined Virtual Reality and Physical Movement on Learning and Engagement**

Presenters: Rocco Marino, Aaliyah James, Bitaniayonas Yonas, Jeremy White, Johndominic Ricciardi, Justin Brijmohan, Nanabanyin Abbiw and Robel Beyene

Faculty Advisors: Dr. Robert Vermilyer, Professor of Computer Science; Dr. Bianca Wentzell, Associate Professor of Biology; Dr. Suzanne Reynolds, Professor of Education

This study examines the combined effects of virtual reality and physical movement on learning and engagement in college students. To do this, our team created a virtual reality environment and an audio explanation to teach about the causes and effects of harmful algal blooms, and also utilized a recumbent bicycle for low-level physical movement. The virtual reality environment was created with Unity, their cinemachine development tool, and Visual Studio Code. This enabled learners to be fully immersed in an outdoor golf course site, containing a lake impacted by harmful algal blooms. The virtual reality simulation includes segments that take place both on land and underwater. 50 college student subjects were randomly assigned to five learning environments: audio, audio & virtual reality, audio & physical movement, audio & virtual reality & physical movement, as well as a control group. Subjects completed a pre- and post- questionnaire measuring their learning and engagement on the material presented. It was hypothesized that being immersed in a virtual reality experience while performing physical movement significantly enhances learning and retention compared to traditional audio-only way of learning. It was also hypothesized that the combination of audio & virtual reality & physical movement significantly enhances engagement.



## **Telling the Spartan Story for STAC Athletics Department**

Presenters: Liam McClinsey and Luis Risquez

Faculty Advisor: Elaine Winship

Working with STAC's Athletic Department and Assistant Director of Athletic Communications, Brad Sarno, Liam McClinsey and Luis Risquez produced a series of videos that highlight the Spartan athletic experience for prospective student athletes. By capturing sports highlights and extensive student-athlete interviews, these videos are intended to serve as an engaging and informative resource for athletes considering STAC.



## **Miles Morales**

Presenter: Justyn Machuca

Faculty Advisor: Nina Bellisio

This is a digital drawing of young superhero: Miles Morales from Spider-Man. He has a serious look on his face and is wearing a dark suit with a red spider symbol on it. The background is a mix of blue and white colors. The art style is bold and smooth, showing him as strong and thoughtful, like he's getting ready for something important.

## **Artificial Intelligence: The Repercussions to Graphic Designers and Their Jobs**

Presenter: Isabella Myers

Faculty Advisor: Nina Bellisio, Professor of Graphic Design

With its rapid growth over the past two years, Artificial Intelligence has become a focal point of technology. While it is very useful as a tool, many people are taking advantage of its sophisticated abilities. With its recent advancements, the creation of art using Artificial Intelligence has become commonplace. Artificial Intelligence that is used properly, can be a tool used to help guide the user with whatever tasks they are trying to complete. Because of this, many jobs are requiring training for these software because they want to start incorporating them into their day-to-day responsibilities. However, the requirement of undergoing additional training can stress many out and those that refuse to return for training are looking at major repercussions. Depending on the situation, Graphic Designers can already have an unstable job and this is adding to the list of uncertainties. Future Designers need to have a mindset that nothing is guaranteed to be permanent within the industry. Even though Graphic Design as a whole has grown substantially over the past years, that does not limit jobs being jeopardized. Through further research, the repercussions of Artificial Intelligence taking over the Graphic Design industry prove just how catastrophic it can be for Graphic Designers and their jobs.

## **From Fiction to Fact**

Presenter: Olivia Calcaterra

Faculty Advisor: Dr. Clara Tóth, Professor of Biology

The growing influence of crime television shows and their captivating storylines has contributed to the spread of inaccurate information and misunderstandings. This study sought to identify who has a more accurate knowledge of forensic science: those who watch the crime shows or those who rely on their own knowledge. To investigate this, a group of students were asked to first indicate whether they have watched crime shows or not, and then using their knowledge of forensic science and investigative techniques to answer questions based on a hypothetical murder case in New York City. The hypothesized results assume that students who do not watch crime shows demonstrate a more accurate understanding of forensic techniques, while those who regularly watch crime shows are more likely to provide inaccurate or exaggerated responses. These potential findings suggest that exposure to crime television shows may lead to misconceptions about forensic science, highlighting the need for more accurate portrayals of forensic practices in the media.

## **College FED Challenge - Navigating Today's Economy: Policy Strategies for Meeting the Dual Mandate**

Presenters: Eliana Raposo, Frank Schaefer, Lilly Lawson, Natalie Oden, Robert Williams, and Ryan Callaghan

Faculty Advisors: Dr. Meghan Mihal, Professor of Economics; Dr. Rossen Trendafilov  
Associate Professor of Finance

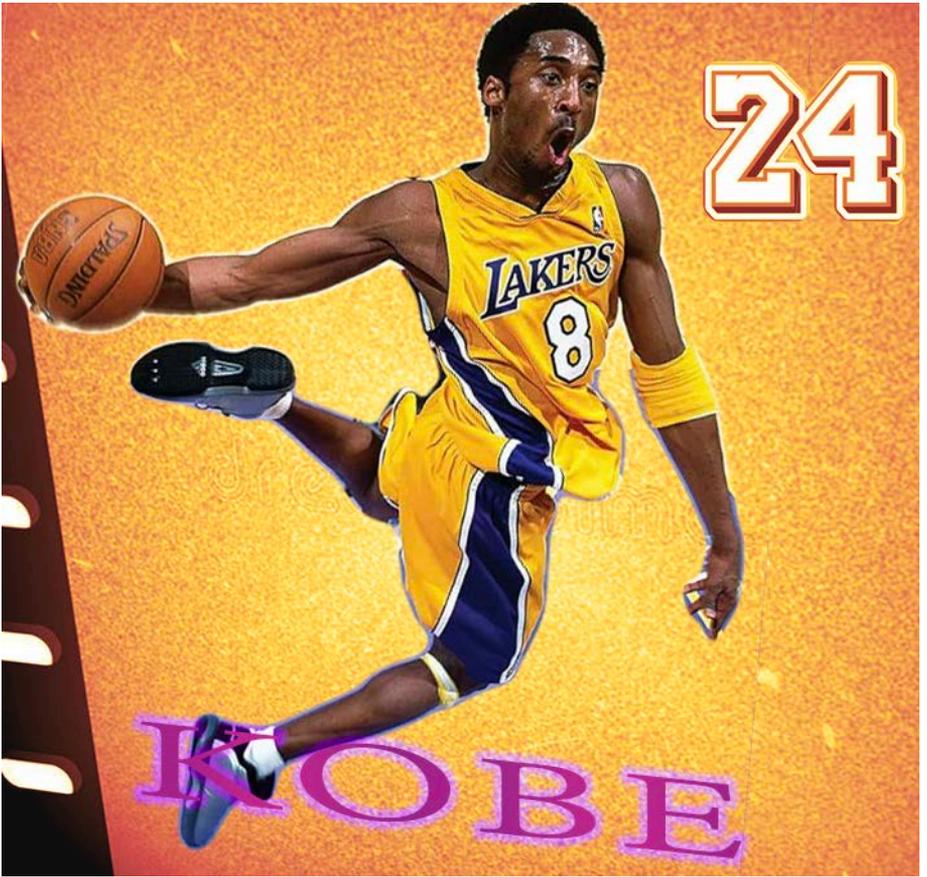
We spent Fall 2024 creating our presentation for the College Fed Challenge, a competition in which teams analyze the current economy and create a policy recommendation based on data that is collected along with a forecast and risk assessment. Additionally, we kept in mind the Federal Reserve's dual mandate of price stability and maximum employment. The Federal Open Market Committee's recent cut of 50 basis points in September has shown their priority of unemployment and recessionary risk over inflation, and our recommendation will build on these priorities.

## **Adaptive Resilience: Molecular Changes In Aging Yeast Cells**

Presenter: Lulit Oyicha

Faculty Advisor: Dr. Stephanie Lauer, Assistant Professor of Biology

Aging is universally understood as a gradual erosion of resilience, marked by increased vulnerability to stress and declining cellular function. However, during the aging process, cells may develop temporary adaptive mechanisms that enhance survival against external challenges. Among the hallmarks of aging, oxidative stress plays a central role, with reactive oxygen species (ROS) driving molecular damage and accelerating senescence. This study investigates the molecular changes in aging cells of *Saccharomyces cerevisiae* (budding yeast) by exposing them to both oxidative stress-inducing agents and oxidative stress-inhibiting factors, such as antioxidants. Yeast serves as an effective model for this study, as it is genetically tractable and shares conserved molecular pathways with complex organisms. Fresh and aged yeast cultures were cultivated, exposed to oxidative stress, and evaluated for survival using spot plating assays. Understanding the molecular changes occurring in these cells during aging offers broader insights into resilience mechanisms relevant to age-related diseases in higher organisms, including neurodegeneration and cancer.



## **Kobe**

Presenter: Jahleel Carcana

Faculty Advisor: Nina Bellisio

The concept for this poster stemmed from the 2k covers on those old games, essentially making a Kobe 2k cover where I take out the background of the original picture and replace it with a tape so it looks like it's on cassette tape and I added the 24 on the side along with Kobe's name in front of it. There are two more versions of this poster that were made for different sizes: billboard, poster, etc. One of my favorite projects I ever worked on as a Graphic Designer/ student.

## **Testing for Coagulation Factors Influencing Hemostasis**

Presenter: Gabriela Mills

Faculty Advisor: Dr. Clara Tóth, Professor of Biology

Werfen is a biomedical company that develops, manufactures, and distributes diagnostic instruments, reagents, and other products for use in hospitals and clinical laboratories. More precisely, Werfen develops, makes and distributes machines that do blood tests, as well as the compounds used in these machines.

These blood tests test for coagulation disorders that negatively impact coagulation factors and lead to either excessive or inadequate clotting, such as hemophilia and von Willebrand disease.

It is vital that doctors are aware of their patients coagulation disorders, particularly in surgery, where inadequate clotting can lead to bleeding out. Because of how vital this information is, it is equally vital that Werfen ensures its products give accurate results. The quality assurance and customer complaint departments do just that.

Quality assurance test lots of reagents at the start, midpoint, and end of their advertised shelf life to ensure they yield accurate results until their expiry date. Customer complaints investigate reports of faulty products from customers by replicating the customer's test to see if their results are replicated. This process includes documentation of the entire process, including taking photographs of vials from the lot in question if a visual inspection is made. In both departments, instruments must be cleaned and calibrated daily to ensure accurate results.

## **Treating Comorbid OCD and Depression with Exercise**

Presenter: Emma Neil

Faculty Advisor: Dr. Ben Wagner, Associate Professor of Psychology

The present study aims to address the effects of exercise on people with comorbid diagnoses of depression and OCD. While many studies exclude people with multiple diagnoses and concurring disorders, it is necessary to test if there is an effective alternative treatment that can be applicable to both when they are co-occurring in the person. The published research has established exercise as an effective treatment for depression and OCD exclusively, but they have not tested the effects of exercise with the presence of multiple concurring mental health diagnoses.



## **SVA Election Video Series**

Presenter: Daniel Casciano

Faculty Advisor: Elaine Winship

This is a series of videos highlighting the perks of being in the SGA, and advertising the candidates. In addition, the video series will also include an announcement of the upcoming new student government.



## **Orangetown Historical Museum**

Presenter: Michael Keegan

Faculty Advisor: Nina Bellisio

This is a short series of documentary/educational videos to promote the Orangetown Historical Museum and the vast collection of history it preserves

# **Comparative Genomic Analysis Of Pseudomonas Aeruginosa Identifying Potential Disinfectant Resistance Genes**

Presenter: Sarah Clancy

Faculty Advisor: Dr. Clara Tóth, Professor of Biology

*Pseudomonas aeruginosa* is a gram-negative bacterium that is highly known for its resistance to different types of cleaning agents, especially in hospital environments. The organism is well adapted and also has the ability to form biofilms, likely from the resistance genes found in its circular chromosome. The bacterium is especially significant in health care environments, posing a threat as infections in patients and on the common surfaces of a hospital. The genome of *Pseudomonas aeruginosa* contains many resistance genes, enhancing the survival and adaptability of the organism.

There have been numerous studies of the PAO1 *Pseudomonas aeruginosa* laboratory strain, leading to the discovery of many genes of disinfectant resistance. While this strain has been extensively studied, it is essential to seek and understand the potential of genetic mutations within the hospital strains that have evolved. This study aims to compare five different hospital strains to the PAO1 laboratory strain, as well as specific points of the DNA that encode for gene expression of resistance.

In order to identify potential mutations within hospital strains, using the BLAST local and global alignments by NCBI, allows for discovery of why certain hospital strains can exhibit more resistance to disinfectants than others. Overall, the goal is to specifically pinpoint these genetic markers on the hospital strains by using the single PAO1 genes obtained directly from the NCBI website. Understanding the resistance mechanisms of the organism can directly contribute to controlling infection rates, improving both sanitation and patient safety in healthcare.

# **Student Bereavement Policies in Higher Education: A Review of Institutional Support in the Northeast**

Presenter: Jennifer Sumba Ruiz

Faculty Advisor: Dr. K Emma Emanuel, Assistant Professor of Biology

The loss of a loved one is a universal yet deeply personal experience that can profoundly impact an individual's well-being. For college students, bereavement can manifest emotionally, psychologically, and academically, often leading to declines in performance, motivation, and mental health. Feelings of grief—including anger, confusion, guilt, and depression—can be particularly challenging in an academic setting. A supportive institutional environment plays a crucial role in helping students navigate their grief while maintaining their academic progress.

Despite the significant impact of bereavement on student success, as of April 2019, only 44 higher education institutions in the United States had formal student bereavement policies. These policies may include academic accommodations such as flexible deadlines, assignment extensions, and remote coursework options, as well as emotional support services like counseling and peer support groups.

This research examines bereavement policies in colleges and universities in the Northeastern U.S., assessing the extent of institutional support available to grieving students. By evaluating existing frameworks, we aim to highlight best practices and advocate for more comprehensive policies that foster both academic success and emotional well-being.

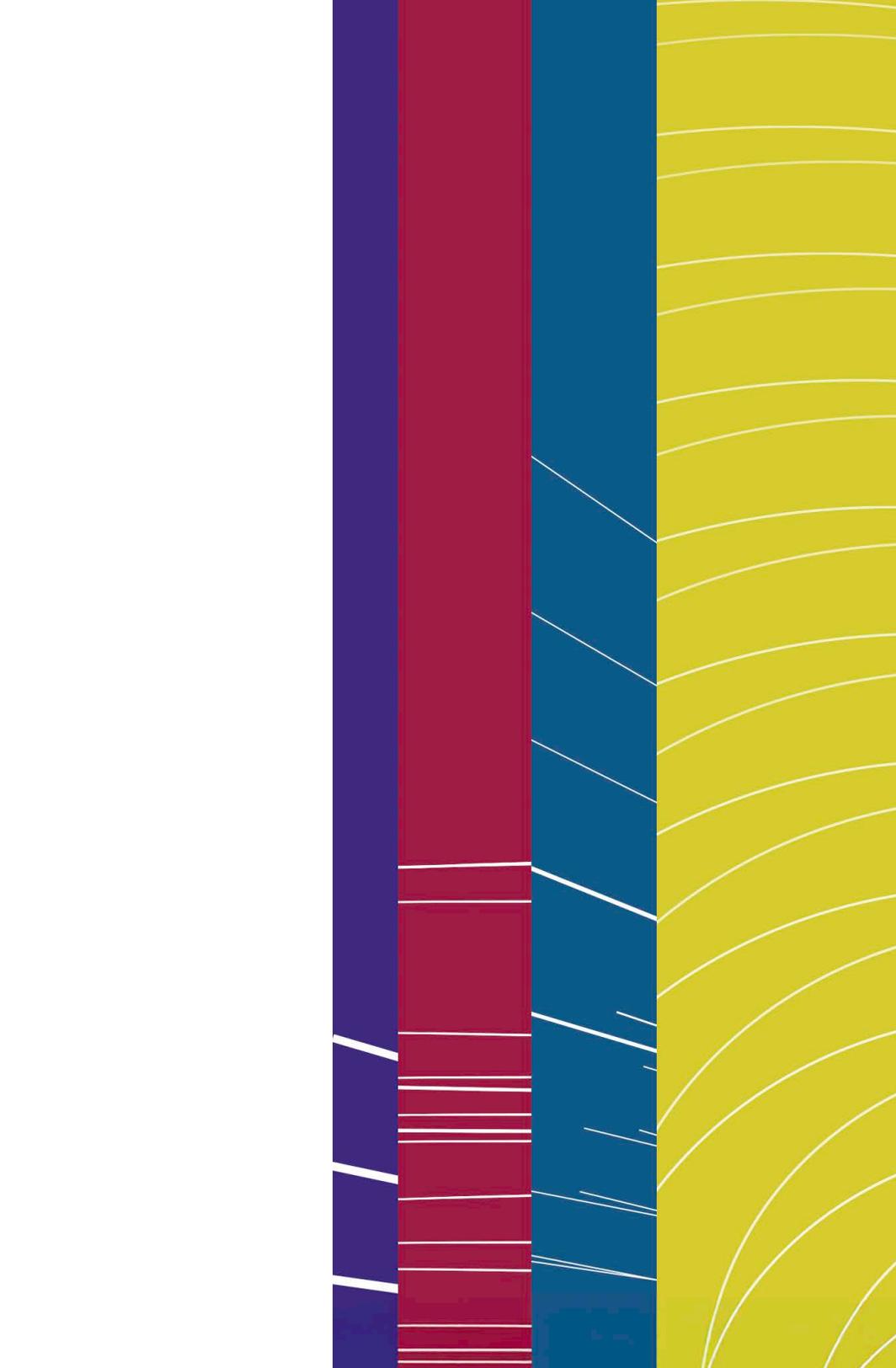


## **I Love You- The People**

Presenter: Cameron Heuer

Faculty Advisor: Nina Bellisio

This collection is a celebration of human connection, emotion, and individuality. My goal was to meet people from all walks of life and do my best to capture their essence through the lens — the subtle beauty, the vulnerability, the strength, and everything in between. I'm deeply grateful to everyone who volunteered their time, opened up, and allowed themselves to be seen. Their willingness to share a piece of themselves made this project what it is: an honest and heartfelt reflection of people. Throughout this journey, I've discovered more than I ever expected — about photography, about others, and about myself. I invite you to explore more of this work in my portfolio book



# AZARIAN MCCULLOUGH ART GALLERY

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