EXPO 2025

THE 12TH ANNUAL EXHIBITION OF UNDERGRADUATE RESEARCH AND CREATIVE ACTIVITIES
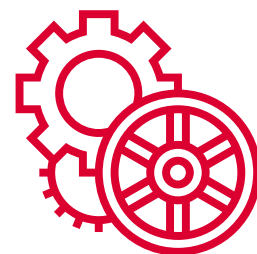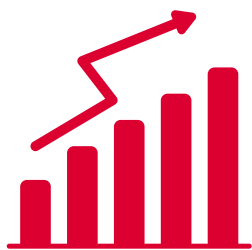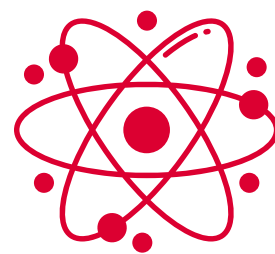
APRIL 23-24, 2025
SETZER STUDENT CENTER

EXPO 2025 Event Summary

EXPO 2025, which is the annual exhibition of student research and creative work at Lamar University, continued the tradition of showcasing research done over the fall and spring semesters at undergraduate and graduate levels, from various STEM and HASBSEB academic areas. This year we had the privilege to welcome four special guest speakers: Dr. Lloyd Lumata, Assoc Prof at UT Dallas, Mr. Larry Toups, Associate Prof. of Space Architecture at University of Houston (U of H), Dr. Asha Winfield, Assis Prof at Louisiana State University (LSU), and Dr. Joshua Guitar, Assis Prof at Kean University. Student visitors from UT Dallas, UT Arlington, Texas A&M, LSU, U of H, U of H—Downtown, and the Galveston College have presented their research in oral and poster sessions.

We had a total of 98 presentations from various academic areas including mathematics, AI, biology, chemistry, geology, physics, communication and film, exercise science, education, business, engineering, and more. We had nine parallel workshops on various topics. Kudos to all EXPO 2025 participants for their high quality presentations!

Several companies including Entergy, PumpTEX Inc., CAVU—Intl, and academia such as Durham University in UK, and the Sasakawa International Center of Space Architecture from U of H, offered nice booths and short presentations. We heartly welcomed the group from the Galveston College led by Dr. Barbara Dover. We thank heartly President Taylor, Dr. Jator, and Dr. Theodori for their presence and continued support to O.U.R. events.

-Dr. Cristian Bahrim, Director of the Office of Undergraduate Research

Thank you, Upper Administration, for your continued support!

Guests presented below:

- **Dr. Jaime Taylor, Lamar University President**
- **Dr. Samuel Jator, Senior Associate Provost and Dean of Undergraduate Studies**
- **Dr. Gene Theodori, Associate Provost for Academic and Research Administration**
- **Dr. Tilisa Thibodeaux, Dean of the Reaud Honors College and Texas Academy**
- **Dr. Joby John, Dean of the College of Business**

OFFICE OF UNDERGRADUATE RESEARCH
LAMAR UNIVERSITY

Agenda of the EXPO 2025

Day 1 - April 23rd, 2025

Poster Session 1

(8:00 am)

Dr. Lloyd L. Lumata's Plenary Talk

(from 9:15 to 10:00 am)

STEM Plenary Session - Ballroom A & B
Chair : Dr. Jane Liu and Dr. Cristian Bahrim

Time	Presenter	Mentor / Note
10:15 AM	Jakub Formella, UT Dallas	Mentor: Dr. Lloyd Lumata
	"13C NMR Spectroscopic Tracking of [2-13C] of Glucose Metabolism in Cultured U87 and LN18 Glioblastoma Cells."	
10:30 AM	Mololuwa Oloyede, Lamar U.—Texas Academy	Mentor: Dr. Cagatay Tokgoz
	"A Comparative Study of Monopole Antennas Using Various Simulation Methods."	
10:45 AM	Jason Withers, Lamar U.	Mentor: Dr. Cristian Bahrim
	"Fundamentals of Light-Matter Interaction for Explaining Optical Phenomena."	
11:00 AM	Jenny Xiaoxuan Tu, Lamar U.—Reaud Honors	Mentor: Dr. Shannon Jordan
	"Landing Mechanics and Muscle Activation in Modern Dancers."	
11:15 AM	Austin Robertson, Lamar U.	Mentor: Dr. Jane Liu
	"Predicting Future Deforestation Hotspots Using Deep Learning and Satellite Images."	
11:30 AM	Mohamed Irhabi, Lamar U.	2025 Beck Fellow
	"Retinal Microvascular Imaging via Optical Coherence Tomography Angiography (OCTA) for Non-Invasive Biomarker Development in Small Vessel Disease and Ischemic Stroke Prognostication."	
11:45 AM	Mahima Verma, Lamar U.	2024 Beck Fellow
	"Advancing Protein Downstream Tasks through Pre-trained Large Language Model Representations."	
12:00 PM	Mohammad Irhabi and Mahima Verma, Lamar U.	Beck Fellows
	"Talking about the Beck Fellowship Application Process and the Benefits of Being a Beck Fellow."	

Study in UK

Ms. Alyce Meyers—North America International Officer for Durham University

(1:00 pm at Ballroom A&B)

Early Afternoon Session - Ballroom A & B
Chair: Dr. Evgeny Romashets

Time		
1:15 PM	**Emmanuel Ameh, University of Texas at Dallas**	Mentor: Dr. Lloyd Lumata
	"13C NMR Spectroscopic Probe of the Metabolic Impact of Dichloroacetate on Colon Cancer Cells."	
1:30 PM	**Ahmed Abuali, University of Houston**	Mentor: Dr. Claudia Ratti
	"A new 4D lattice QCD equation of state: extended density coverage from a generalized T'-expansion."	
1:45 PM	**Christian Schmidt, University of Houston**	Mentor: Dr. Rene Bellwied
	"Extracting Observables from Trajectum, a Heavy-Ion Collision Model."	
2:00 PM	**John Steinman, Rice University**	Mentor: Dr. Matthias Heinkenschloss
	"Matrix-Free Linear Algebra for Trajectory Optimization."	

Early Afternoon Session - Setzer Ctr. - Sabine 2
Chair: Dr. Masud Rana

Time		
1:15 PM	**Abraham Barrera-Nouhra, Lamar U.**	Mentor: Dr. Masud Rana
	"Checkmate: A Classic Computing Program."	
1:30 PM	**Giyol Rajarethinam**	Mentor: Dr. Masud Rana
	"Trust Talk End-to-End Encrypted Messaging."	
1:45 PM	**Luis Maldonado, Lamar U.**	Mentor: Dr. Masud Rana
	"AccountMe: Personal Finance & Budgeting Application by Utilizing OOP Programming."	
2:00 PM	**Audrey Kirby, Lamar U.**	Mentor: Dr. Masud Rana
	"Cue'd Up: Making Your Next Favorite Movie One Tap Away."	

Late Afternoon Session - Setzer Ctr., Ballroom A & B
Chair: Dr. Robert Kelley Bradley

Time		
2:30 PM	**Rishi Bharadwaj, Lamar U.**	Mentor: Dr. Cristian Bahrim
	"Changing the Reflectivity of Silica Surfaces Using the Coherent Coupling Between Two cw-Laser Beams."	
2:45 PM	**MD Yasin Arafat, Lamar U.**	Mentor: Dr. Yueqing Li
	"Blockchain Technology in Supply Chain & Logistics: Enhancing Transparency and Traceability Using Data Mining Techniques."	
3:00 PM	**MD Momen Shahriar Joarder, Lamar U.**	Mentor: Dr. Robert Kelley Bradley
	"Optimization of Extrusion Parameters and Performance Evaluation of 3D Printed Cubes Using a Pellet-Based Gigabot X2 Printer."	
3:15 PM	**Yeasin Habib, Lamar U.**	Mentor: Dr. Xuejun Fan
	"Predictive Finite Element Modeling of Molded Interconnect Substrate (MIS) Package Reliability During Reflow Soldering."	
3:30 PM	**Abdulhafeez Bello, Lamar U.**	Mentor: Dr. Robert Kelley Bradley
	"Performance Evaluation of Low-Density Polyethylene Pads for Steel Pipeline Support."	
3:45 PM	**Suraj Jadhav, Lamar U.**	Mentor: Dr. Robert Kelley Bradley
	"A Study of Creep Behavior of Microstructures using Electron Beam Actuation."	

Late Afternoon Session - Setzer Ctr. - Sabine 1
Chair: Dr. Yueqing Li and Dr. Wenhao Yang

Time		
2:30 PM	**Jake Hawkins, Lamar U**	Mentor: Dr. Edythe Kirk
	"Dark Tetrad Confluence ."	
2:45 PM	**Jiyoon Jeon, Lamar U.**	Mentor: Dr. Ashwini Kucknoor
	"The Effect of Short Chain Fatty Acids and Eicosapentaenoic acid on Ethanol-induced Neuroinflammation in the SH-SY5Y cell."	
3:00 PM	**Sadman Islam, Lamar U.**	Mentor: Dr. Tauhidul Alam
	"Spatiotemporal Water Quality Prediction from In-Situ Sensor Measurements."	
3:15 PM	**Sheikh Muhammmad Fareed, Lamar U.**	Mentor: Dr. Yueqing Li
	"Predictive Finite Element Modeling of Molded Interconnect Substrate (MIS) Package Reliability During Reflow Soldering."	
3:30 PM	**Fakir Sheik Zihad, Lamar U.**	Mentor: Dr. Yueqing Li
	"Comparison & Validation of Statistical Method for Forecasting Industrial & Residential Water Demand Using Machine Learning."	
3:45 PM	**Jacob Lindh, Lamar U.**	Mentor: Dr. Yueqing Li
	"The Relationship Between Anterior-Posterior Ball Position and Golf Swing Wrist Kinematics in Elite Golfers."	

Poster Session 2
(4:00 pm)

Mr. Larry Toups - Banquet Talk
(from 6 to 7pm)

Banquet
(5 to 6pm in the Ballroom A&B of Setzer Center)

Awards Ceremony for FMA/SURF
(from 7pm, at the Ballroom A&B of Setzer Center)

Agenda of the EXPO 2025

Day 2 - April 24th, 2025

Poster Session 3
(8:00 am)

Dr. Joshua Guitar's Plenary Talk
(from 9:15 to 10:00 am)

HASBSEB Plenary Session - Ballroom A & B
Chairs: Dr. Shannon Jordan and Dr. Gina Hale

Time	Presenter	Mentor / Note
10:15 AM	Jakub Formella, UT Dallas	Mentor: Dr. Lloyd Lumata
	"13C NMR Spectroscopic Tracking of [2-13C] of Glucose Metabolism in Cultured U87 and LN18 Glioblastoma Cells."	
10:30 AM	Mololuwa Oloyede, Lamar U.—Texas Academy	Mentor: Dr. Cagatay Tokgoz
	"A Comparative Study of Monopole Antennas Using Various Simulation Methods."	
10:45 AM	Jason Withers, Lamar U.	Mentor: Dr. Cristian Bahrim
	"Fundamentals of Light-Matter Interaction for Explaining Optical Phenomena."	
11:00 AM	Jenny Xiaoxuan Tu, Lamar U.—Reaud Honors	Mentor: Dr. Shannon Jordan
	"Landing Mechanics and Muscle Activation in Modern Dancers."	
11:15 AM	Austin Robertson, Lamar U.	Mentor: Dr. Jane Liu
	"Predicting Future Deforestation Hotspots Using Deep Learning and Satellite Images."	
11:30 AM	Mohamed Irhabi, Lamar U.	2025 Beck Fellow
	"Retinal Microvascular Imaging via Optical Coherence Tomography Angiography (OCTA) for Non-Invasive Biomarker Development in Small Vessel Disease and Ischemic Stroke Prognostication."	
11:45 AM	Mahima Verma, Lamar U.	2024 Beck Fellow
	"Advancing Protein Downstream Tasks through Pre-trained Large Language Model Representations."	
12:00 PM	Mohammad Irhabi and Mahima Verma, Lamar U.	Beck Fellows
	"Talking about the Beck Fellowship Application Process and the Benefits of Being a Beck Fellow."	

Early Afternoon Session - Setzer Ctr. - Sabine 1
Chair: Dr. Sara Hillin

Time	Presenter	Mentor
1:30 PM	**Gabriel Atapu, Lamar U.** *"LGBT Inclusion in the Military: A Comparative Study of Policies and Practices in The Netherlands and The United Kingdom."*	Mentor: Dr. Christina Gregory
1:45 PM	**DeShara C. Doub, Louisiana State U.** *"Tackling Intergenerational Racial Trauma within Historical Institutions."*	Mentor: Dr. Asha Winfield
2:00 PM	**Carolina Hernandez, Lamar U.** *"¡OYE! Abre tus ojos: To Hispanic/Latino Sign Language Interpreter Hardships."*	Mentor: Dr. Douglas C. Williams Jr
2:15 PM	**Avinash Sah, Lamar U.** *"Preparing Future Educators with Engaging Port Education & Activities."*	Mentor: Dr. Mamta Singh
2:30 PM	**Ramona Young, Lamar U.** *"A Vertigo of Fear: Hitchcock's Psychological and Technical Mastery of Stairs and Falling."*	Mentor: Mr. Andre Favors
2:45 PM	**Justin Ford, Lamar U.** *"How Microtransactions Have Evolved in Modern Gaming."*	Mentor: Dr. Sara P. Hillin
3:00 PM	*Maryah Javed, Lamar U.* *"Navigating Maritime Education: Insights from Elementary Students."*	Mentor: Dr. Mamta Singh
3:15 PM	**Angel Griffin, Lamar U.** *"Digging Deeper: The World of Accommodation & Participation Through the Workings of Preservice Teacher."*	Mentor: Dr. Mamta Singh
3:30 PM	**Kenechukwu Chikezie, Lamar U.** *"Highly Selective Dual-Mode Chemosensor for Hg2+ and Cu2+ Detection with Distinct Fluorescence Switching in Aqueous DMSO Solution."*	Mentor: Dr. Zhifo Guo
3:45 PM	**Kendyl Thomas, Lamar U.** *"Evaluating Effects of Process Parameters on Polymer 3D Printing."*	Mentor: Dr. Ebrahim Seidi

Late Afternoon Session - Setzer Ctr.- Ballroom A & B
Chair: Dr. Nicki Michalski

2:30 PM	**Alexa Heng, Lamar U.**	**Mentors: Dr. Sheila Springer and Dr. Nicki Michalski**
	"Navigating Sexual and Emotional Communication in Generation Z University Situationships."	
2:45 PM	**Keturah Green, Louisiana State U.**	**Mentor: Dr. Asha Winfield**
	"Where Them Fans At: How social media influencers and trending media create pandemonium, parasocial relationships, and communities of belonging."	
3:00 PM	**Evan Wolford, Lamar U.**	**Mentor: Mr. Andre Favors**
	"Censorship?: An Analysis of Discourses of Three Kendrick Lamar Performances."	
3:15 PM	**Carolyne Tarver, Louisiana State U.**	**Mentor: Dr. Asha Winfield**
	"Becky with the Good Hair? The Perpetuation of Eurocentric Dating Preferences, Black Women, & Contemporary Dating Shows."	
3:30 PM	**Hayli Hunter, Louisiana State U.**	**Mentor: Dr. Asha Winfield**
	"Striking Back: Megan Thee Stallion's 'Cobra' as a Narrative of Black Feminist Resilience."	
3:45 PM	**Mikayla Renwick, Texas A&M/Louisiana State U.**	**Mentor: Dr. Asha Winfield**
	"Shaping Cities: Understanding the Impact of the Great Migration on Cultural Freedom."	

Dr. Asha S. Winfield's Plenary Talk

(from 4:00 to 4:45 pm)

Awards Ceremony - EXPO/Closing Remarks

(from 5:00 pm)

The 12th Annual Exhibition of Undergraduate Research and Creative Activities – EXPO 2025

GUEST SPEAKER
Dr. Joshua Guitar, Ph.D.

Assistant Professor
Department of Communication, Media, and Journalism
Center for Academic Success
Kean University

Live Oak Ballroom of Setzer Center
April 24, 2025 - from **9:15 – 10:00 am**

SHORT BIOGRAPHY:

After completing a BA in Communication at Adrian College, Joshua Guitar earned his MA and PhD in Communication from Wayne State University. Joshua currently serves as an Assistant Professor of Communication at Kean University where he teaches classes in rhetoric, critical media studies, and political communication. Joshua employs both classical and critical methods of rhetorical inquiry to examine mediated political discourse, oftentimes to interrogate the rhetorical manifestations of ideology that inhibit democratic discourse, civil liberties, and political equity. Joshua's research has been featured in communication journals like Critical Studies in Media Communication, Communication and Democracy, and Western Journal of Communication. Joshua recently authored a book entitled Dissent, Discourse, and Democracy: Whistleblowers as Sites of Political Contestation, published by Lexington Books in 2021. Joshua is also an editor for a forthcoming volume with State University of New York Press. The edited collection is entitled From a Whisper to a Movement: Investigating the Shared Rhetorical Spaces of Whistleblowing and Social Protest. Joshua has also won numerous awards for his research, including the 2019 Top Paper Award in the Political Communication division of the National Communication Association, the 2022 James Madison Prize for Outstanding Research in First Amendment Studies, the 2023 Robert M. O'Neill Top Paper Award in the Freedom of Expression division of the National Communication Association, and a 2024 Emerging Scholar Award from the Communication Research Network. Joshua also enjoys serving as a research mentor to undergraduate and graduate students, and he has received institutional recognition for his collaborations with mentees.

LECTURE: From Polarity to Plurality

Societal progress often results from citizens who publicly actualize democracy's core tenets of liberty and equality. Yet, recent discourses surrounding such activism have augmented a polarizing political landscape. In this lecture, I explain how an ideology of polarity undergirds our perceptions of democracy and fosters the present polemics within our public sphere. In response to this predicament, I advance the theory of *amongness* as a way to extract truth from the rhetorical tensions across these discourses. This process serves two epistemic functions. First, it assists in raising public consciousness to the threats to a free and equal society. Second, it helps us recognize how these strained discourses expose the broader state of a democratic public. I will demonstrate how we can situate the health of a democracy by evaluating the rhetorical currents among discursive tensions to inform, in turn, a move from a problematic polarity to an ethic of plurality.

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The 12th Annual Exhibition of Undergraduate Research and Creative Activities – EXPO 2025

GUEST SPEAKER
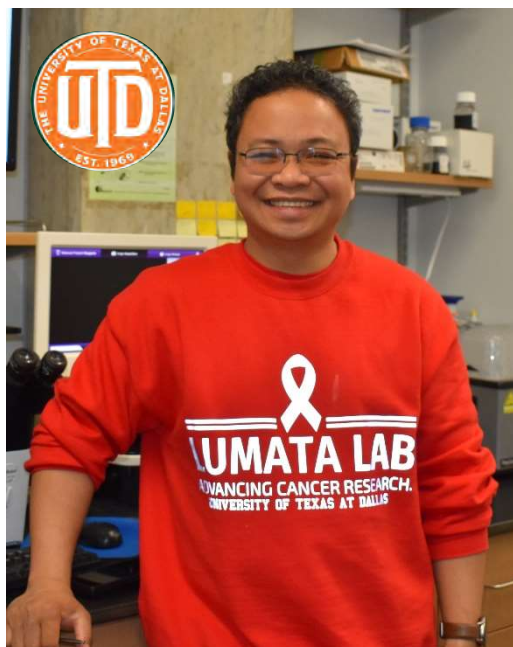# Dr. Lloyd L. Lumata, Ph.D.

Associate Professor of Physics
Department of Physics
Affiliated to Dept. of Neuroscience & Dept. of Bioengineering
University of Texas at Dallas

Live Oak Ballroom of Setzer Center
April 23, 2025 - from **9:15 - 10:00 am**

SHORT BIOGRAPHY:

Lloyd Lumata obtained his BS in Physics at the Western Mindanao State University, Philippines in 2002. He went to graduate school at the National High Magnetic Field Lab in Florida State University (FSU) in 2004 wherein he studied nuclear magnetic resonance (NMR) of organic conductors under the supervision of Prof. James Brooks at the National High Magnetic Field Laboratory. He earned his PhD in Condensed Matter Physics at FSU in 2008. In 2009, he moved to Dallas for a postdoc position at the University of Texas Southwestern Medical Center (UTSW). At UTSW, he assembled an MRI signal-enhancing instrumentation called hyperpolarizer that amplifies the MRI signals by >10,000-fold. This machine was used for high resolution cardiac and cancer imaging. In 2014, he moved to the neighboring University of Texas at Dallas (UTD) as an Assistant Professor in the Department of Physics wherein he leads a research group that applies this hyperpolarization technology for non-invasive diagnostic assessment of cancer. He was promoted to Associate Professor of Physics with tenure at UT Dallas in 2020.

LECTURE: Hyperpolarized Magnetic Resonance: Enhancing NMR and MRI Signals by >10,000-fold for Metabolic Assessment of Cancer

Nuclear magnetic resonance (NMR) spectroscopy and imaging (MRI) of nuclei other than a proton, especially of mass-limited samples, is hampered by the low signal sensitivity due to the tiny differences in spin populations between the nuclear Zeeman energy levels. This intrinsic NMR insensitivity of nuclei such as carbon-13 or nitrogen-15 stems from their relatively low gyromagnetic ratio, leading to lower Boltzmann-dictated thermal nuclear polarization, thus lower NMR or MRI signal. Dynamic nuclear polarization (DNP) or hyperpolarization via the dissolution method, an offshoot of a technology used in particle physics and nuclear scattering experiments, has solved this insensitivity problem by amplifying the magnetic resonance signals of insensitive nuclei such as carbon-13 by >10,000-fold. In this process, a sample with the target nuclei is typically dissolved in a glassing matrix (e.g. glycerol:water solution) and doped with trace amount of stable organic free radicals (e.g. trityl OX063 or TEMPO). The trick is to transfer the high electron thermal polarization to the nuclear spins via microwave irradiation close to the electron spin resonance (ESR) frequency of the free radicals at low temperature (close to 1 K) and high magnetic field (>1 T). To harness these amplified NMR signals at cryogenic temperatures, the frozen polarized samples are rapidly dissolved into hyperpolarized liquids at physiologically tolerable temperatures in a span of 5-10 s. These hyperpolarized liquids are then administered in vitro in NMR tubes with cancer cell suspensions or injected in vivo in living subjects for real-time biochemical monitoring and imaging of cellular metabolism. In this talk, I will delve into the discussion of the physics, instrumentation and engineering aspects, optimization methods, and biomedical applications of the dissolution DNP technology. This cutting-edge physics technology is currently improving cancer diagnostics by providing biochemical and metabolic information at the molecular level with superb sensitivity and high specificity.

OFFICE OF UNDERGRADUATE RESEARCH
LAMAR UNIVERSITY

The EXPO 2025

BANQUET SPEAKER

Mr. Larry Toups

Adjunct Associate Professor
Space Architecture Graduate Program
University of Houston
Live Oak Ballroom of Setzer Center
April 23, 2025 - from **6:00-7:00pm**

SHORT BIOGRAPHY:

Larry Toups attained a Bachelor of Architecture Degree from the University of Houston. After practicing architecture, he received a Masters Degree in Space Architecture from the University of Houston Sasakawa Institute for Space Architecture (SICSA). From June 1988 – January 1994 he was a Senior Engineer with Lockheed Engineering and Sciences Company at Johnson Space Center. In this role, he provided technical support for JSC's New Initiatives Office in the area of Systems Engineering of habitats and planetary systems and contributed to numerous NASA studies on the exploration of the moon and Mars. After joining NASA in 1994 he worked in the International Space Station (ISS) Program Office and assumed the role of Habitability Systems Lead in the ISS Vehicle Office and was responsible for human factors requirements, and hardware items such as Crew Quarters, Galley and Food Systems for the ISS. Mr. Toups retired from NASA in January 2020. Currently he is an Adjunct Professor at the Sasakawa International Center for Space Architecture at the University of Houston College of Engineering. He is also a visiting faculty member at Rice University within the Environmental Studies Program, and at Lund University School of Industrial Design in Lund, Sweden.

LECTURE: The Theory and Practice of Space Architecture

Space exploration with humans has evolved greatly over the last 50 years. In 1961 Yuri Gagarin became the first human in space aboard Vostok 1, circling Earth at a speed of 27,400 kilometers per hour with the flight lasting 108 minutes. From 1961 – 1972, NASA's Apollo Program sent nine missions into space with the goal of a human landing on the moon. That goal was accomplished on the Apollo 11 mission when astronauts Neil Armstrong and Buzz Aldrin landed their Apollo Lunar Module (LM) on July 20, 1969, and walked on the lunar surface. Then starting in the 1970's to the present, space stations in low Earth orbit have enabled humans to live and work in space for as long as one year. As humans spend longer periods of time in space, the emerging field of Space Architecture has introduced an added skill set to those provided by the engineering and science disciplines.

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The 12th Annual Exhibition of Undergraduate Research and Creative Activities – EXPO 2025

GUEST SPEAKER

Dr. Asha S. Winfield, Ph.D.

Assistant Professor
Manship School of Mass Communication
Louisiana State University
Founder/Director, The Storytellers Lab
Affiliate, Department of African & African American Studies
Affiliate, Department of Screen Arts

Live Oak Ballroom of Setzer Center
April 24, 2025 - from **4:00 – 4:45 pm**

SHORT BIOGRAPHY:

Dr. Asha Winfield is an Assistant Professor at LSU's Manship School of Mass Communication and a creative scholar whose work blends visual and oral storytelling with critical theories. Winfield is an alumna of Lamar University '12 and former communication instructor in the Department of Communication where her love of storytelling grew in practice and applicability. After graduating from Lamar, Winfield began her graduate studies at the University of Houston where research and practice became clearer and graduated in 2015. After graduating with her masters, she joined the faculty at Lamar and LIT and taught classes on Public Speaking, Interpersonal Communication, Foundations of Black TV & Film, Interviewing, and Business Communication. In 2021, Winfield graduated from Texas A&M University with her doctoral degree in Communication and began teaching at Louisiana State University. Her education added with her love of photography and videography, added to her desire to explore the power of storytelling among groups and individuals.

As a filmmaker, educator, and researcher, she explores the narratives, rituals, and practices of Black American communities in media, culture, and society. Her interdisciplinary approach to research integrates intersectionality and Black feminist thought to highlight the dynamic connections between audience reception, memory-making, and health behaviors.

Dr. Winfield founded *The Storytellers Lab* at LSU in January 2022, a space where she collaborates with students on innovative visual research projects and documentary research. Her creative projects include *Our Black COVID-19 Stories*, a documentary series capturing the lived experiences of Black communities during the pandemic. Since joining the Manship School, she has co-produced over 25 short documentaries about culture in the US South with her graduate and undergraduate students. Her scholarly contributions appear in journals like *Health Communication* and *Women's Studies in Communication*, as well as several book chapters and digital forums. Dr. Winfield's work bridges theory and creativity to center the voices and stories of communities whose voices have historically been excluded or silenced. In her talk, she plans to discuss the importance of seeing and sitting with the stories around us as researchers and neighborhood storytellers.

LECTURE: The Stories We Tell, The Stories We Live: Connecting Collective Memory, Qualitative Research, and Community Storytellers in Our Work

Stories are everywhere—stitched and braided into the fabric of our lives, shaping how we understand ourselves and the world around us. From the grand narratives of history that make it to the textbooks of the education system to the intimate tales of our families and neighborhoods, our stories hold the power to preserve memories, influence research, and inspire change on multiple levels. In this interactive plenary session at the Undergraduate Research Expo, we will explore the significance of recognizing, sharing, and preserving the stories around us. Together, we'll examine our personal youthful tales, intergenerational legacies, family health narratives, and the digital archives of our lives found on social media, dating apps, and beyond. The goal is to discuss how stories reveal and change us, while also empowering our work as storytellers, practitioners, researchers, and historians. By telling our own stories, we not only claim agency over our identities but also contribute to the larger tapestry of history and scholarship. Additionally, by carefully crafting the stories of our communities with the community, we shape and reshape [re]presentation and the hope of ourselves more nuanced, clear, and complex in media and society. Through reflection and engagement, this session will challenge us to see how our stories shape our research, methodologies, and ontologies, reminding us of all that lies within our shared narratives, culture, and identities.

OFFICE OF UNDERGRADUATE RESEARCH
LAMAR UNIVERSITY

Thank you, to our Plenary Guest Speakers!

EXPO 2025 Awards Ceremony

The winners at the Annual Exhibition for Undergraduate Research and Creative Activities conference were Lamar U. students, as well as student visitors. Their presentations have been judged by the Lamar U. faculty and our guest speakers, who scored their performance based on rubrics approved by the Advisory Board of O.U.R. Besides diplomas, the first-place winner received a $150 prize, second-place winner received $100, and the third-place winner received $50. The winners have been celebrated at the awards ceremony on May 5, 2025, in a ceremonial gathering with guests for high administration. At the awards ceremony, every winner gave a five-minute summary of their work presented at the EXPO 2025.

Winners for Oral Presentations – Graduate STEM

First place: John Steinman (Rice University, Houston, Texas)
Matrix-Free Linear Algebra for Trajectory Optimization
Mentor: Dr. Matthias Heinkenschloss (Rice University)
Co-authors: Aurya Javeed (Sandia National Laboratories, Albuquerque, New Mexico), **Drew Kouri** (Sandia National Laboratories), **Denis Ridzal** (Sandia National Laboratories), and **Isaac M. Ross** (Naval Postgraduate School, Monterey, California)

Second place: Kenechukwu Chikezie (Department of Chemistry and Biochemistry, Lamar U.)
Highly Selective Dual-Mode Chemosensor for Hg2+ and Cu2+ Detection with Distinct Fluorescence Switching in Aqueous DMSO Solution.
Mentor: Dr. Zhifo Guo (Department of Chemistry and Biochemistry, Lamar U.)

Third place: Jiyoon Jeon (Department of Biology, Lamar U.)
The Effect of Short Chain Fatty Acids and Eicosapentaenoic acid on Ethanol-induced Neuroinflammation in the SH-SY5Y cell
Mentor: Dr. Ashwini Kucknoor (Department of Biology, Lamar U.)

Winners for Oral Presentations – Graduate HASBSEB

First place: Avinash Sah (Department of Mechanical Engineering, Lamar U.)
Preparing Future Educators with Engaging Port Education & Activities.
Mentor: Dr. Mamta Singh (Department of Curriculum & Instruction, Lamar U.)

Second place: Mikayla Renwick (Department of Communication & Media, Manship School, Louisiana State University, Department of Communication, Texas A&M)
Shaping Cities: Understanding the Impact of the Great Migration on Cultural Freedom.
Mentor: Dr. Asha Winfield (Department of Communication & Media, Manship School, Louisiana State University)

Third place (tied): Hayli Hunter (Department of Communication & Media, Manship School, Louisiana State University)
Striking Back: Megan Thee Stallion's 'Cobra' as a Narrative of Black Feminist Resilience.

Third place (tied): Carolyne Tarver (Department of Communication & Media, Manship School, Louisiana State University)
Becky with Good Hair? The Perpetuation of Eurocentric Dating Preferences, Black Women & Contemporary Dating Shows
Mentor: Dr. Ashwini Kucknoor (Department of Communication & Media, Manship School, Louisiana State University)

Winners for Oral Presentations – Undergraduate STEM

First place: Mohamed Irhabi (Department of Biology, Lamar U.)
Retinal Microvascular Imaging via Optical Coherence Tomography Angiography for NonInvasive Biomarker Development in Small Vessel Disease & Ischemic Stroke Prognostication.
Mentor: Dr. Ioannis Petropoulos (Department of Research in Medicine, Weill Cornell Medicine) and **Dr. Ashwini Kucknoor** (Department of Biology, Lamar U.)

Second place: Christian Schmidt (Department of Physics, College of Natural Sciences & Mathematics, University of Houston)
Extracting Observables from Trajectum, a Heavy-Ion Collision Model.
Mentor: Dr. Rene Bellwied (Department of Physics, College of Natural Sciences & Mathematics, University of Houston)

Third place: Austin Robinson (Department of Computer Science, Lamar U.)
Predicting Future Deforestation Hotspots Using Deep Learning and Satellite Images.
 Mentor: Dr. Jane Liu (Department of Computer Science, Lamar U.)

EXPO 2025 Awardees

Winners for Oral Presentations – Undergraduate HASBSEB

First place (tied): Ramona Young (University Studies, Lamar U.)
A Vertigo of Fear: Hitchcock's Psychological and Technical Mastery of Stairs and Falling.
Mentor: Mr. Andre Favors (Department of Communication & Media, Lamar U.)

First place (tied): Maryah Javed (Department of Nutrition, Lamar U.)
Navigating Maritime Education: Insights from Elementary Students.
Mentor: Mamta Singh (Department of Curriculum & Instruction, Lamar U.)

Second place: Justin Ford (Department of English and Modern Languages, Lamar U.)
How Microtransactions Have Evolved in Modern Gaming.
Mentor: Dr. Sara P Hillin (Department of English and Modern Languages, Lamar U.)

Third place: Carolina Lizbeth Hernandez (Department of Deaf Education, Lamar U.)
¡OYE! Abre tus ojos: To Hispanic/Latino Sign Language Interpreter Hardships.
Mentor: Dr. Douglas C. Williams Jr. (Department of Deaf Education, Lamar U.)

EXPO 2025 Awardees

Winners for Poster Presentations – Undergraduate STEM

First place: Lizbeth Perez (Department of Industrial and System Engineering, Lamar U., Galveston Community College, Galveston)
Creep Test Rig.
Co-authors: Diela Amely Muno and **Keyty Michel Loza** (Galveston Community College, Galveston)
Mentor: Dr. Robert Kelley Bradley (Department of Industrial and System Engineering Lamar U.)

Second place: George Guy (Reese Construction Management Program, College of Business, Lamar U.)
Advanced Technologies and Its Growing Role in Modern Construction.
Co-authors: Bryce McMorris, Jacob Perales, and **De'asia Nickerson** (Reese Construction Management Program, College of Business, Lamar U.)
Mentor: Dr. Minkyum Kim (Reese Construction Management Program, College of Business, Lamar U.)

Third place: Brayan Alonso-Prieto, Bryce McMorris, Jacob Perales, and De'asia Nickerson (Reese Construction Management Program, College of Business, Lamar U.)
Impact of Back-Assist Exosuits on Productivity, Physical Capability, and Health Outcomes in Construction Work.
Mentor: Dr. Minkyum Kim (Reese Construction Management Program, College of Business, Lamar U.)

EXPO 2025 Awardees

Winner for Poster Presentations – Undergraduate HASBSEB
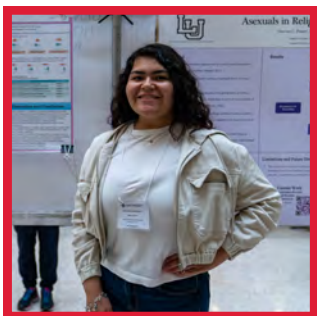
Winner: Allison Deras (Department of Speech and Hearing Sciences, Lamar U.)

Classroom Seating Preference and Auditory Capabilities in Students with Hearing Loss.

Mentor: Dr. Priyanka Jaisinghani (Department of Speech and Hearing Sciences, Lamar U.)

Winner for Poster Presentations – Graduate Level

Winner: Jannatul Hur (Department of Industrial and Systems Engineering, Lamar U.)

Enhancing Learning Efficiency and Ergonomic Well-Being: A Comparative Study of Handwritten, AI-Assisted, and Digitally Structured Notetaking.

Mentor: Dr. Yueqing Lit (Department of Industrial and Systems Engineering, Lamar U.)

EXPO 2025
Book of Abstracts
Part I - Oral
Presentations

Glossary:

- **PL_1_T1** means Plenary Session #1 – Talk #1
- **BR_x_T1** means Breakout Session #x –Talk #1
- **GR** means Graduate student.
- **UR** means Undergraduate student.
- **UG-H** means Undergraduate student in HASBSEB area.
- **UG-S** means Undergraduate student in STEM area.
- **SURF** means Summer Undergraduate Research Fellowship.
- **URG** means Undergraduate Research Fellowship (at Lamar University)
- **H– Humanities, Arts, Social and Behavioral Sciences, Education, and Business**
- **S– Science, Technology, Engineering, and Mathematics**

McNair, SURF, Beck, Welch, and other sponsorship programs are indicated.

Presenter: Ahmed Abuali [$]

Major: Physics

Email: amabuali@uh.edu

Mentor: Dr. Claudia Ratti [$,#,%]

Co-authors: Zabolcs Bors´anyi [#], Zolt´an Fodor [%], Johannes Jahan [$], Micheal Kahangirwe [$], Paolo Parotto [&], Attila P´asztor [%], Claudia Ratti [$], Hitansh Shah [$] and Seth A. Trabulsi [@]

[$] Department of Physics, University of Houston

[#] Department of Physics, Wuppertal University, Germany

[%] Institute for Computational and Data Sciences, Pennsylvania State University, Department of Physics, State College

[&] Dipartimento di Fisica, Universit`a di Torino and INFN Torino

[@] Department of Physics & Astronomy, Rice University, Houston

BR_1_T2 / GR-S / In progress
Faculty Research Grant

A new 4D lattice QCD equation of state: extended density coverage from a generalized T ′-expansion.

We present a new equation of state for QCD in which the temperature T and the three chemical potentials for baryon number µB, electric charge µQ and strangeness µS can be varied independently. This result is based on a generalization of the T ′ -expansion scheme, thanks to which the diagonal µB extrapolation was pushed up to a baryo-chemical potential µB/T ∼ 3.5 for the first time. This considerably extended the coverage of the Taylor expansion, limited to µB/T < 2.5 – 3. As a consequence, we are able to offer a substantially larger coverage of the four-dimensional QCD phase diagram as well, compared to previously available Taylor expansion results. Our results are based on new continuum estimated lattice results on the full set of second and fourth order fluctuations.

Presenter: Emmanuel Ameh [$]

Major: Physics

Email: Emmanuel.Ameh@utdallas.edu

Mentor: Dr. Lloyd Lumata [$,#,%]

[$] Department of Physics, University of Texas at Dallas

[#] Department of Bioengineering, University of Texas at Dallas

[%] Department of Neuroscience, University of Texas at Dallas

BR_1_T1 / GR-S / In progress
Faculty Research Grant

13C NMR Spectroscopic Probe of the Metabolic Impact of Dichloroacetate on Colon Cancer Cells.

Dichloroacetate (DCA) has shown promise as a therapeutic agent in cancer treatment by targeting the altered metabolism of cancer cells. In this study, we utilized 13C Nuclear Magnetic Resonance (NMR) spectroscopy to explore the metabolic effects of DCA on cultured colon cancer cells. By employing stable isotope-labeled glucose and other substrates, we traced the carbon atoms' journey through key metabolic pathways, offering a comprehensive view of the cellular metabolic response to DCA. Our findings reveal significant changes in the 13C-labeled metabolite profiles of colon cancer cells upon DCA exposure. Detailed results of this investigation will be presented.

Presenter: Md Yasin Arafat [$]
Major: Industrial Engineering
Email: marafat@llamar.edu
Mentor: **Dr. Yueqing Li** [$]
Co-authors: Sayeda Sufia Sumi [$], Sabab Al Farabi [$], and Nadia Islam Tanha [$]
[$] Department of Industrial and System Engineering, Lamar University

BS_3_T2 / GR-S / Early-phase Independent research

Blockchain Technology in Supply Chain & Logistics: Enhancing Transparency and Traceability Using Data Mining Techniques.

In today's globalized and technology-driven economy, supply chain and logistics management (SC&L) play a critical role in ensuring the seamless movement of goods, services, and information across interconnected networks of suppliers, manufacturers, distributors, and consumers. However, traditional SC&L systems often suffer from inefficiencies, fragmented data flows, fraud risks, and a lack of transparency, which can lead to operational disruptions, increased costs, and reduced customer trust. To address these challenges, blockchain technology has emerged as a transformative solution, providing a decentralized, secure, and immutable digital ledger. By enabling real-time, tamper-proof records of transactions, blockchain enhances trust, accountability, and traceability across the entire supply chain and logistics network. This ensures that all stakeholders, from raw material suppliers to end consumers, have access to accurate and verifiable data.

Moreover, the integration of blockchain with data mining techniques offers an advanced analytical layer that enables organizations to extract patterns, detect anomalies, and optimize logistics performance. Data mining can leverage blockchain-stored information to improve demand forecasting, identify fraud, and enhance supply chain visibility, ultimately leading to more data-driven decision-making and operational efficiency. This project explores how the combined use of blockchain technology and data mining techniques can enhance transparency and traceability in supply chain and logistics management. The study aims to demonstrate how this integration strengthens supply chain integrity, reduces inefficiencies, and fosters resilient, technology-driven supply chain ecosystems.

Presenter: <mark>Gabriel Apatu</mark> [$]
Major: Master of Public Administration
Email: apatu.gabriel@gmail.com
Mentors: **Dr. Christina Gregory** [$]
[$] Department of Political Science, Lamar University

LGBT Inclusion in the Military: A Comparative Study of Policies and Practices in The Netherlands and The United Kingdom.

According to Goodhart and Taylor (2020), the United States of America is still grappling with the challenge of fully integrating LGBT inclusion in the US military. While President Obama removed all restrictions on lesbians, gays, and bisexuals (LGB) personnel there continue to be restrictions on transgender personnel within the Department of Defense (DoD).

While America faces challenges with the LGBT issue, Europe may have advanced in finding a clear path to including LGBTs fully in their militaries. European countries dominate the first 20 places on the LGBT Military Index with 16 countries (Polchar, Sweijs, Marten and Galdiga, 2014). Polchar et al (2014) find as European countries have become more accepting of the LGBT community, they have embraced policies allowing LGBT to serve openly in their militaries. The study found the existence of evidence to link social acceptance to these societies' attitudes to military policies, which further confirms the relationship between public opinion polling on homosexuality and the acceptance of LGBTs in the military.

The main research question is: "How have shifts in public opinion affected the ability of gays to openly serve?" I will use process tracing to conduct a comparative case study on the Netherlands and the United Kingdom to understand the relationship between social acceptance and societal attitudes toward military policies and the military personnel's level of tolerance and acceptance of colleagues who are LGBT as it relates to cohesion in service.

Presenter: <mark>Natalie Bean</mark> [$]
Major: Nursing
Email: nbean@lamar.edu
Mentors: **Dr. Gina Hale** [$]
[$] JoAnne Gay Dishman School of Nursing, Lamar University

Generating Educational Materials on Firearm Safety: Action to Promote Public Safety.

In the United States, there is growing concern regarding firearm violence. Because firearm violence is considered to be a public health crisis, licensed nurses are in a unique position to be able to spread firearm violence awareness and provide public education on firearm safety. Licensed nurses may have little to no knowledge about firearm safety which then impedes their ability to communicate with patients and families about these safety measures. In a research study we conducted in Spring 2024, we found that an increase in firearm safety knowledge increases nurses' confidence in educating patients about firearm safety. Additionally, licensed nurse study participants suggested creating educational materials to facilitate

patient education surrounding firearm safety. Educational resources have been generated for both licensed nurses and patients, with the hope that nurses will have an increased ability to learn about firearm safety and pass that information to their peers and their patients. Further, by having generated a version of this educational material that is geared toward patients, licensed nurses will be able to more easily share firearm safety information with patients. This could have implications for ultimately reducing the rate of firearm violence and accidental firearm injury as the public becomes more aware of firearm safety practices.

Presenter: <mark>**Abdulhafeez Bello** [$]</mark>

Major: Engineering Management

Email: abello3@lamar.edu

Mentor: **Dr. Robert K. Bradley** [$]

[$] Department of Industrial and System Engineering, Lamar University

Performance Evaluation of Low-density Polyethylene Pads for Steel Pipeline Support.

Corrosion damage at pipelines poses significant economic, environmental, and integrity concerns. This research aims to investigate the feasibility of using low-density polyethylene (LDPE) as a material for steel pipeline support pads. The objectives of this research are to design and fabricate LDPE pads that minimize atmospheric moisture buildup and assess their mechanical performance under various loading conditions. It is expected that the use of LDPE pads will provide corrosion resistance and mechanical performance similar to existing high-cost pads, but with greater cost-effectiveness, ultimately contributing to the development of improved pipeline support systems. This research has the potential to reduce the economic and environmental costs associated with corrosion damage, and its outcomes will inform the design and implementation of more sustainable pipeline support solutions.

Presenter: <mark>**Michael Bellot** [$]</mark>

Major: Kinesiology

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Mentors: **Dr. Shannon Jordan** [$] and **Dr. Daniel Chilek** [$]

[$] Department of Exercise Sciences, Lamar University

A Comparison of the Abdominal Contraction Bracing Method (CBM) and the Glass Cup Abdominal Bracing Method (GCM).

The Glass Cup Method (GCM) is a core stabilization technique designed to enhance intra-abdominal pressure (IAP) through targeted inhalation and contraction of the anterior (Rectus Abdominis), lateral (Transverse Abdominis, External Oblique, Internal Oblique), and posterior (Quadratus Lumborum) core muscles. By creating a cylindrical wall of muscular tension around the Core Muscle Complex, GCM aims to

generate higher muscular activation and improved stability compared to the traditional Contraction Bracing Method (CBM). In this study, subjects performed five sets of one-repetition maximum (1RM) hex bar deadlifts using both GCM and CBM, while bilateral muscle activity was recorded via ten Bluetooth EMG sensors. Results indicated that the GCM yielded a higher average 1RM (385 ± 84.36 lbs) than CBM (360 ± 75.50 lbs), reflecting an average increase of 25 lbs or 6.20%, with the highest individual improvement reaching 10%. All successful participants demonstrated performance gains with GCM and reported increased stability and comfort. However, some subjects experienced difficulty mastering the GCM technique and adapting to the Hextreme bar within the limited training time. These preliminary findings suggest that GCM may be an effective method to enhance lifting performance and core stability. Further research with extended training protocols is recommended.

Presenter: Rishi Bharadwaj [$]
Major: Electrical and Computer Engineering
Email: rbharadwaj@lamar.edu
Mentor: Dr. Cristian Bahrim [#, $]
[$] Phillip Drayer Department of Electrical & Computer Engineering, Lamar Univ.
[#] Department of Physics, Lamar University

BS_3_T1 / GR-S / Advanced
Doctoral project

Changing the Reflectivity of Silica Surfaces Using the Coherent Coupling Between Two cw-Laser Beams.

We present experimental evidence of an even distribution of interference maxima and minima in the normalized parallel reflectance at low voltages, when two TEM_{oo} continuous-wave (cw-) laser beams are incident upon a silica crown glass surface. This spatial distribution aligns with the theoretical predictions for a diffraction grating. Diode lasers were employed because of their longer coherence lengths and higher operational stability. Silica crown glass was selected for its widely used applications in optical devices. We collect data simultaneously at the detection and monitoring branches. A set of polarizers was used in the experiment to organize and attenuate the laser beams. The polarized lasers generated an array of polarized dipoles on the crown glass surface, which acts collectively as a diffraction grating. An 8° region around Brewster angle was investigated. The angular separation between adjacent maxima and minima at 0 volts is 1.571° and it reduces gradually when we assist the two-laser interaction over the same surface dipoles with an increasing energy background. The location of maxima and minima is consistent with the predicted values of the theoretical model, within an experimental error of 0.30°. The index of refraction and the Brewster angle both increase in value with the increasing voltage. The interference patterns we observed are out of phase for certain voltages and certain angles of incidence, thus creating an ON and OFF switch effect. This interference pattern can be improved through the enhancement of the degree of coherence (DOC).

Presenter: Kenechukwu Chikezie [$]
Major: Chemistry
Email: kchikezie@lamar.edu
Mentor: Dr. Zhifo Guo [$]

BS_5&6_T9 / GR-S / Advanced
Faculty Research Grant

$ Department of Chemistry & Biochemistry, Lamar University

Highly Selective Dual-Mode Chemosensor for Hg2+ and Cu2+ Detection with Distinct Fluorescence Switching in Aqueous DMSO Solution.

This study presents the development of a thiourea derivative-based chemo-sensor and its precise fluorometric response to Hg2+ and Cu2+ ions. The chemo sensor ligand underwent a precise two-step synthesis process and was thoroughly characterized using NMR, IR, and MS techniques. Optimization experiments established that the sensor achieves maximum fluorescence in a 75% DMSO-water mixture at pH 7.4 and displays remarkable stability across varying pH levels. Selectivity tests revealed significant fluorescence quenching upon interaction with Hg2+ and Cu2+ ions, though further titration confirmed binding ratio to Hg2+ and Cu2+. The fluorescence of the chemosensor, quenched by Hg2+, was restored upon the addition of EDTA or glutathione. However, Cu^{2+} did not exhibit a similar effect. Competition assays demonstrated the ligand's superior selectivity for Hg2+ and Cu2+ even in complex matrices, with only minor, isolated interference from Fe2+ verified with Job's plot analysis. These findings present the ligand as an exacting and reliable chemo-sensor, optimized for detecting Hg2+ and Cu2+ with unparalleled precision. The study underscores its potential as a critical tool for environmental and industrial applications demanding robust and selective ion detection.

Presenter: Kayla Diaz [#]   PL_2_T5 / GR-H / In progress
Major: Psychology
Email: kdiaz11@lsu.edu
Mentors: **Dr. Asha Winfield** [$]
[#] School of Psychology, Louisiana State University

Working Memory and Type 2 Diabetes: Investigating Racial Differences in Self-Management.

The proposed study aims to examine the association between Type 2 Diabetes and the impact it can have on cognitive functions, particularly decline of working memory among older white and African American adults. Participants will be exposed to vignettes of study materials designed to help them understand the components of food supplements and encourage proper self-management strategies. After viewing the vignette, they will be exposed to the nutritional facts of the food supplements through an assessment. The assessment will vary in ease of comprehension across participants through symbols or nutritional labels. The following assessment will be designed to test their understanding and ability to retain information to apply proper self-management strategies. All participants will also receive an SLUMS examination to measure cognitive decline and participate in OSPANS tasks to measure working memory for each group. Based on previous literature, it is hypothesized that older African American adults with Type 2 Diabetes will showcase a significant decline in working memory compared to their white counterparts. This will be demonstrated by older African American adults scoring lower on the assessments due to not being able to retain the information to apply for adequate self-management regimens. Given the higher rates of Type 2 Diabetes among the African American community, results from this study will help add to previous literature and highlight the impact Type 2 Diabetes can have on cognitive functions. By exploring the impact of Type 2 Diabetes among African American adults and their

cognitive outcomes, this research can highlight the challenges faced by older African American adults with Type 2 Diabetes and applying proper self-management regimens to help assist this chronic condition.

Presenter: DeShara C. Doub [#]

Major: Social Work

Email: ddoub2@lsu.edu

Mentor: Dr. Asha Winfield [$]

[#] School of Social Work, Louisiana State University

[#] Department of Communication and Media, Louisiana State University

BR_5 & 6_T2 / GR-H / In progress
Doctoral Research

Tackling Intergenerational Racial Trauma within Historical Institutions.

This presentation explores the pervasive and enduring impact of intergenerational racial trauma and its manifestation within historical institutions such as churches, colleges and universities, and social service systems. Grounded in the complexities of theoretical frameworks like post-traumatic growth and post-traumatic slave syndrome, this session unpacks how centuries of systemic racism have not only shaped institutional policies and practices but have also left lasting psychological and physiological imprints on marginalized communities. Through an examination of historical events, entrenched patterns, and contemporary institutional behaviors, this work investigates how racial trauma is transmitted across generations—and how historical institutions continue to either reinforce or disrupt this cycle. The presentation will offer practical strategies to continue the legacy of healing by recognizing, responding to, and repairing racialized harm in institutional environments, while fostering pathways rooted in accountability, resilience, and restorative justice.

Presenter: Thomas Duong [$]

Major: Statistics

Email: duongt13@gator.uhd.edu

Mentor: Dr. Timothy A. Redl [$]

[$] Department of Mathematics & Statistics, University of Houston-Downtown

PL_2_T1 / UG-S / In-progress
Senior project in statistics

Taking Advantage of Advanced Placement (AP) Statistics for College Admission: A Study of High School Students in the Houston Area.

This project explores the Advanced Placement (AP) Statistics test scores of high school students across various districts in the Houston area. It compares them to local colleges' minimum score requirements for college admission and course equivalency. Through this analysis, the study highlights trends and differences in how colleges accept AP Statistics scores for credit. Based on the findings, the project provides recommendations to the University of Houston-Downtown (UHD) regarding appropriate minimum AP Statistics scores for college credits and course equivalency. These recommendations aim to help UHD establish clearer policies that better align AP credit with the expectations of college-level courses, benefiting both students and the institution.

Presenter: Sheikh Muhammad Fareed [$]

BR_4_T4 / GR-S / In progress

Major: Industrial & System Engineering
Email: sfareed@lamar.edu
Mentor: Dr. Yueqing Li [$]
Co-authors: Prakriti Thapa [$], Muhammad Hashim Zia [$], and Pani Bioucki [$]
[$] Department of Industrial & System Engineering, Lamar University

Analysis of supplier performance using data mining techniques.

Supplier performance is crucial for cost efficiency, product quality, and supply chain reliability. Traditional evaluation methods often rely on subjective judgments, leading to inconsistencies, delays, and biased decisions. This study adopts a data-driven approach by applying data mining techniques to evaluate and classify suppliers based on their performance. The objective is to increase the accuracy and consistency of supplier assessments, automate analysis, and support strategic procurement decisions.

Using a dataset of 845 records with 26 variables covering purchase orders, financial metrics, supplier details, and approval statuses, we derive new features like order lead time, reliability scores, and cost variance to improve model performance. The study applies a range of data mining algorithms to analyze supplier performance. K-means clustering groups suppliers by performance, DBSCAN identifies outliers and irregular supplier behavior, Random Forest and Support Vector Machines (SVM) classify suppliers and detect high-risk vendors, and Principal Component Analysis (PCA) simplifies the dataset for visualization. Classification and risk detection are based on critical features such as on-time delivery rate, defect rate, lead time variability, order rejection rate, and cost variance.

Model performance is evaluated using accuracy, precision, recall, F1-score, and silhouette score. The study successfully classifies suppliers into high, medium, and low performance groups and identifies high-risk suppliers requiring attention. This data-driven approach minimizes disruptions, optimizes decisions, and offers a scalable framework adaptable across industries. By replacing bias with analytics, the study advances supplier management, supporting resilient supply chains.

Presenter: Justin Ford [$]   BR_5 & 6_T6 / UG-H / In progress
Major: English Literature
Email: jford29@lamar.edu
Mentor: Dr. Sara P Hillin [$]
[$] Department of English and Modern Languages, Lamar University

How Microtransactions Have Evolved in Modern Gaming.

Microtransactions have significantly transformed modern gaming, reshaping how developers monetize games and how players engage with them. Introduced initially as optional purchases for cosmetic items or minor in-game advantages, microtransactions have evolved into a dominant revenue model, especially in free-to-play and live-service games, but have started to be implemented in single-player story games that do not have a multiplayer component where the consumer would even need to buy or be prompted to buy microtransactions for a game that does not need them. Single player microtransactions are simply there for the companies to get more money from the consumer and encourage them to potentially buy these microtransactions to skip the grind of playing the game to unlock cosmetics or gameplay mechanics to buff their characters. Their presence has influenced game design, leading to mechanics such as loot

boxes, battle passes, and in-game economies that encourage continuous player spending. Games like Fortnite and the NBA 2K series are two of the biggest examples of this revenue model, where they make more money from microtransactions than game sales. While microtransactions have enabled longer game lifespans and frequent content updates, they have also sparked debates on fairness, gambling-like mechanics, and player exploitation. Countries like the United Kingdom have been implementing bans on some microtransactions because they deem them as unlawful due to their extreme spending nature. Through various scholarly articles, industry reports, and critical analyses, this paper explores the evolution of microtransactions, their influence on modern gaming, and the ongoing discourse surrounding their ethical implications.

Presenter: Jakub Formella [$]

Major: Neuroscience

Email: Jakub.Formella@UTDallas.edu

Mentor: Dr. **Lloyd Lumata** [$,#,%]

[$] Department of Physics, University of Texas at Dallas

[#] Department of Bioengineering, University of Texas at Dallas

[%] Department of Neuroscience, University of Texas at Dallas

PL_1_T1 / UG-S / In progress
Faculty Research Grant

13C NMR Spectroscopic Tracking of [2-13C] of Glucose Metabolism in Cultured U87 and LN18 Glioblastoma Cells.

The Krebs cycle, a central metabolic pathway in mitochondria, oxidizes acetyl-CoA derived from carbohydrates, fats, and proteins to produce NADH and FADH2. These molecules carry high-energy electrons to the electron transport chain, where they drive the synthesis of ATP through oxidative phosphorylation. This study explores the dynamics of the Krebs cycle in glioblastoma cells by using [2-13C] D-Glucose as a metabolic tracer in two glioblastoma cell lines, U87 and LN18. The cells were cultured in glucose-enriched media until reaching sufficient density and then seeded in regular media for 24 hours. Subsequently, one set of flasks was incubated for 48 hours in media containing [2-13C] D-Glucose, while the other set was maintained in regular media for 47 hours and exposed to [2-13C] D-Glucose for the final hour. Both cells and media were collected and analyzed using 13C NMR spectroscopy to probe the metabolic fluxes of the Krebs cycle, providing detailed information into altered metabolic pathways in glioblastoma. Details of this will be presented.

Presenter: Keturah Green [$]

Major: Mass Communication

Email: kgre179@lsu.edu

Mentor: **Dr. Asha Winfield** [$]

[$] Department of Communication and Media, Manship School, Louisiana State University

BR_7_T2 / GR-H / Early phase

Where Them Fans At: How Social Media Influencers and Trending Media Create Pandemonium, Parasocial Relationships, and Communities of Belonging Abstract.

Social Media Influencers are the new celebrities. This presentation and rhetorical analysis seek to explore the ways in which parasocial relationships, viral content, and online communities develop on digital platforms. The presenter will be sure to share all the deeds on where fans are out, who they're following, and why!

Presenter: S M Yeasin Habib [$]

Major: Mechanical Engineering

Email: shabib6@lamar.edu

Mentor: **Dr. Xuejun Fan** [$]

Co-authors: Guangxu Li [#], Yutaka Suzuki [#], and Rajen Murugan [#]

[$] Department of Mechanical Engineering, Lamar University

[#] Texas Instruments, Dallas, Texas 75243

BR_3_T4 / GR-S / Advanced Doctoral project

Predictive Finite Element Modeling of Molded Interconnect Substrate (MIS) Package Reliability During Reflow Soldering.

This study investigates the reliability of Molded Interconnect Substrate (MIS) packages during the reflow soldering process, focusing on failure based on localized moisture concentration and thermal stress effects. Moisture impacts package reliability by inducing hygroscopic swelling, reducing interfacial adhesion, and generating high vapor pressure, while the coefficient of thermal expansion (CTE) mismatch among different materials lead to high thermal stresses during peak reflow temperature. Six different MIS package designs featuring copper substrates with Ajinomoto Build-up Films (ABF) were used for finite element modeling. The polymeric materials, which includes ABF and epoxy mold compound (EMC) were characterized using an environmental chamber under four different conditions: 30°C/60% RH, 60°C/60% RH, 85°C/60% RH, and 85°C/85% RH. The finite element model included preconditioning step prior to reflow, to estimate the moisture concentration at the beginning of the reflow process. The empirical MSL test results of the packages followed by TC500 temperature cycling showed failure by delamination at the mold substrate interface under the die area. Therefore, moisture related reliability of the packages was ranked based on the maximum localized moisture at the mold substrate interface under the die area. The thermal stress related reliability was ranked based on the maximum peeling stress, shear stress and strain energy density at the die corner region of the mold substrate interface. The FEA-derived rankings for both the moisture and thermal stresses exhibited good correlation with empirical test results, confirming the model's accuracy in predicting reliability of MIS packages during reflow.

Presenter: Jake Hawkins [$]

Major: Psychology

BR_4_T1 / UG-S / Early phase Independent research

Email: jhawkins32@lamar.edu
Mentor: **Dr. Edythe Kirk** [$]
[$] Department of Psychology, Lamar University

Dark Tetrad Confluence.

The Dark Tetrad, made up of psychopathy, Machiavellianism, sadism, and narcissism, has many inconsistencies in the literature. All of these traits exhibit high comorbidity yet, when examined individually, seem to have opposing and mutually exclusive outcomes. Specifically, there is difficulty in finding an empirical difference between Machiavellianism and psychopathy. However, the two traits are related to different economic outcomes. I believe that the true distinction between the two is the relationship between psychopathy and sadism as well as Machiavellianism and narcissism. Psychopaths are prone to sadistic tendencies both through physiological and emotional means. Machiavellians are prone to narcissistic tendencies through ideological and philosophical means. Both narcissists and sadists have traits that solve for the negative emotional consequences that come with being a Machiavellian and a psychopath. It makes more sense for sadism to be developed as a supportive trait to the psychopath in order to combat their high neuroticism. The same is true for the Machiavellian if narcissism is viewed as a supportive trait designed to help focus their obsessive and impulsive personalities.

Presenter: Alexa Heng [$]
Major: Sociology
Email: aheng@lamar.edu
Mentors: **Dr. Sheila Springer** and **Dr. Nicki Michalski** [#]
[$] Department of Sociology, Lamar University
[#] Department of Communication and Media, Lamar University

BR_7_T1 / UG-H / In progress URG research

Navigating Sexual and Emotional Communication in Generation Z University Situationships.

The phenomenon of situationships, a concept evolved from friends with benefits, casual hookups, and flings, reflects Generation Z's (Gen Z) agency and independence as the vocal advocates of the emerging generation. The conceptual definition of situationships is non-exclusive, undefined romantic relationships that resist clear labels or commitment but often exhibit many features of a traditional relationship, such as physical intimacy, emotional vulnerability, and the appearance of exclusivity. Utilizing qualitative interviews with 10 anonymous participants, this study will investigate how students at Lamar University navigate these dynamics, particularly in a sexually charged environment with a lack of sex education. Key areas of focus will include factors such as boundaries, exclusivity, gender, dating apps, and attachment styles. By examining how partners navigate sexual and emotional communication, this study aims to explore how these types of relationships impact communication patterns, boundaries, and expectations among Gen Z university students.

Presenter: Carolina Lizbeth Hernandez [$]
Major: American Sign Language
Email: chernande107@lamar.edu

BR_5 & 6_T7 / UR-H / Early phase SURF project

Mentor: **Dr. Douglas C. Williams Jr** [$]
[$] Deaf Studies and Deaf Education, Lamar University

¡OYE! Abre tus ojos: To Hispanic/Latino Sign Language Interpreter Hardships.

Sign language interpreters, as representatives of the communities and cultures they serve, should mirror the ethnic, racial, and cultural demographics of their clients. The sign language interpreting profession in the United States, however, is hardly diverse; most practitioners are white women. Although precise data was not found, if most sign language interpreters in Texas are white, native English users as is true of the profession on a national level, this is a demographic imbalance in need of investigation and remediation. This pilot study explores potential reasons for the lack of Hispanic/Latino1 sign language interpreters, beginning first with interpreting professionals in Texas. Specifically, this investigation seeks to understand obstacles unique to Hispanic/Latino sign language interpreters and how these individuals navigate these obstacles and the stresses of the interpreting profession. This exploratory, qualitative study will use semi-structured interviews for data collection and thematic analysis for data inspection and reporting.

Presenter: <mark>Hayli Hunter</mark> [$]
Major: Mass Communication
Email: hhunt11@lsu.edu
Mentor: **Dr. Asha Winfield** [$]
[$] Department of Communication and Media, Manship School, Louisiana State University

BR_7_T5 / GR-H / Early phase Independent research

Striking Back: Megan Thee Stallion's 'Cobra' as a Narrative of Black Feminist Resilience.

On the intersection of race and gender, Black women have been subjected to a unique form of oppression coined misogynoir. While the term misogynoir has recently entered contemporary discourse, Black women have faced gendered racism for centuries. This content analysis will explore Megan Thee Stallion's song "Cobra," specifically analyzing the lyrics and the music video. Through a Black feminist lens, I will examine how Megan Thee Stallion employs visual imagery and lyrics to convey messages of strength, resilience, and empowerment while simultaneously challenging misogyny and other forms of gendered racism. By positioning Megan Thee Stallion as a symbol of hope and resistance for Black women, this research highlights the importance of her artistry in uplifting Black women's voices and reclaiming control of our own narratives. My goal is to not only provide a deeper understanding of Megan Thee Stallion's impact in this arena but also open avenues for future research on Black feminism and music representation.

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PL_1_T6 / UG-S / Early phase Beck research

Retinal Microvascular Imaging via Optical Coherence Tomography Angiography (OCTA) for Non-Invasive Biomarker Development in Small Vessel Disease and Ischemic Stroke Prognostication.

For my summer Beck Fellowship project, I will investigate the potential of Optical Coherence Tomography Angiography (OCTA) as a non-invasive biomarker for Small Vessel Disease (SVD) in patients with ischemic stroke. SVD is a major contributor to neurodegenerative diseases and cognitive decline but remains difficult to detect and diagnose early due to limitations in current imaging technologies. OCTA provides high-resolution, three-dimensional images of the retinal microvasculature, offering a novel way to study small blood vessels without the need for contrast agents or injections. The retina is considered an extension of the central nervous system and shares structural and functional similarities with the brain's microvasculature. This project hypothesizes that OCTA can detect early changes in retinal microcirculation that reflect or even precede alterations in the brain's small vessels. By analyzing OCTA images, this research will aim to identify retinal vascular changes associated with SVD in ischemic stroke patients and correlate these findings with traditional neuroimaging (MRI) and clinical disability measures. The goal of this project is to assess the potential of OCTA to serve as an early, non-invasive biomarker for the detection of SVD. This could enhance stroke monitoring and facilitate early interventions in neurodegenerative diseases, where timely diagnosis is crucial for improving patient outcomes. The study will involve analyzing OCTA images from stroke patients, comparing these findings with MRI scans, and evaluating the relationship between retinal vascular changes and clinical measures of disability. Ultimately, this work could contribute to establishing OCTA as a reliable diagnostic tool for SVD and expand its use in the broader neurovascular disease landscape.

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Spatiotemporal Water Quality Prediction from In-Situ Sensor Measurements.

Predicting water quality parameters poses a significant challenge due to their inherent spatiotemporal variability in aquatic environments. Consequently, effective sensing and modeling necessitate reasoning about in-situ measurements sensed across spatial and temporal scales. To address this challenge, we leverage spatially distributed time series data on key water parameters (e.g., temperature, dissolved oxygen, salinity) gathered along autonomous robot trajectories to predict their values throughout the aquatic environment. Our methodology involves initially normalizing this data to facilitate spatial interpolation. After that, we train several neural network-based AI models, including Long Short-Term Memory (LSTM), Convolutional LSTM (ConvLSTM), and Transformer, to forecast these water parameters. We then compare the predictive performance of these models using various evaluation metrics such as RMSE and MAE. Our results demonstrate the capability of our models to predict water parameter values with reasonable accuracy.

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A Study of Creep Behavior of Microstructures using Electron Beam Actuation.

Two-photon stereolithography (TPS) is an advanced additive manufacturing technique that creates intricate 3D micro and nanostructures with sub-micron resolution. Common materials used are photopolymers like acrylic-based resins chosen for their optical transparency and rapid solidification. These dielectric structures can be actuated using a scanning electron microscope (SEM) beam. The focused electron beam interacts with the insulating material, inducing localized charging and electrostatic forces. By adjusting the SEM's accelerating voltage, current, and scanning pattern, a mechanical motion can be achieved. SEM-based actuation enables real-time imaging and feedback, enhancing control.

An attempt is being made to actuate a small structure using a SEM beam. It has been observed that we can control the direction of the motion of the structure if we follow a specific pattern to focus the beam. The amount of motion depends on how long the beam is focused. However, it has also been observed that the motion decreases as the number of cycles are increased. Attempts are being made to find a pattern between the dimensions of the structure and the amount of motion. A goal has been established that we should get the motion that will be within a range that was predicted beforehand for the structures with the same shape and dimensions. Necessary changes will be made to the structure in terms of shape and dimensions to fulfill the goal. This will enable us to create a customized microstructure which can do some simple tasks.

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Navigating Maritime Education: Insights from Elementary Students.

Research indicates that incorporating port and maritime education into K-12 curricula enhances students' understanding of global systems. This approach also makes subjects like science, geography, and economics more engaging and relatable. The present study aimed to determine how exposure to maritime career information influences elementary students' perceptions and self-assessment of their abilities in maritime professions. The study consisted of two phases: a pilot study and a follow-up study. Elementary students were introduced to maritime careers through educational materials covering professions such as ship captain, marine engineer, dockworker, and port manager. Teachers facilitated brief discussions on the

importance of maritime industries in global trade and everyday life to provide context and encourage engagement. A quantitative survey-based approach was employed to explore elementary students' knowledge, awareness, and interest in maritime careers. Data was collected through structured questionnaires containing multiple-choice questions regarding career preferences and open-ended responses to assess students' reasoning behind their selections. The results demonstrate the effectiveness of the follow-up study in achieving the research goal: increasing student awareness and understanding of the maritime industry. Students exhibited not only shifts in attitude but also a deeper conceptual understanding of the field's diversity. Their responses moved beyond surface-level associations to more personalized and informed reasoning.

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The Effect of Short Chain Fatty Acids and Eicosapentaenoic acid on Ethanol-induced Neuroinflammation in the SH-SY5Y cell.

Ethanol toxicity induces oxidative stress, glial cells activation, and neuroinflammation, affecting expression of receptors such as TLR8, FFAR4, and GPR84. TLR8 is an immune receptor that recognizes viral infection or cellular damage. FFAR4 and GPR84 are metabolic receptors that recognize a various range of fatty acid, modulating cellular homeostasis. Short-chain fatty acids (SCFAs), including acetate, propionate, and butyrate, are metabolites produced by gut microbiota from dietary fibers and have been shown to reduce neuroinflammation, support blood-brain barrier integrity, and modulate immune responses. Eicosapentaenoic acid (EPA) is a polyunsaturated omega-3 fatty acid and is known to have anti-inflammatory properties. Ethanol treatment (100 mM) decreased TLR8 and FFAR4 expression while increasing GPR84 expression. SCFAs and EPA, when administered alone, increased the expression of these receptors. Importantly, co-treatment with SCFAs and EPA restored TLR8 and FFAR4 expression, while modulating GPR84 expression by reducing its ethanol-induced upregulation. SCFAs and EPA demonstrated neuroprotective effects against the cell death induced by ethanol in a dose-dependent manner. These findings suggest that SCFAs and EPA can counteract ethanol-induced immune dysregulation by restoring proper receptor expression. This study highlights the potential therapeutic value of SCFAs and EPA in managing alcohol-induced neuroinflammation and other neurodegenerative conditions, offering a novel approach to improving brain health through dietary modulation

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Optimization of Extrusion Parameters and Performance Evaluation of 3D Printed Cubes Using a Pellet-Based Gigabot X2 Printer.

This study investigates the optimization of extrusion parameters for 3D printing a 1-inch cube using the Gigabot X2, a pellet-based printer. The focus is on improving print quality through parameter adjustments such as printing speed and extrusion rate. Several samples were printed with varying settings, numerically defined for comparative analysis. Surface roughness was measured to assess the precision of the prints, and impact tests were conducted to evaluate the mechanical properties of the samples. Results demonstrate how fine-tuning extrusion parameters influences surface finish and material durability, offering insights for improving the performance of pellet-based 3D printing.

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Cue'd Up: Making Your Next Favorite Movie One Tap Away.

Cue'd up is a personalized movie recommendation and streaming app that is designed to help users discover their next favorite film with the tap of a few buttons. By using viewing history, ratings, and genre preferences, the app will deliver tailored suggestions that are unique to each user's taste. To accomplish this, it uses object-oriented programming (OOP) principles that manage the user profiles, movie data, and the algorithm for recommending efficiently. So, whatever you may be into, Cue'd Up will keep your watch list perfectly curated.

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The Relationship Between Anterior-Posterior Ball Position and Golf Swing Wrist Kinematics in Elite Golfers.

This study investigates how variations along the anterior-posterior (A-P) ball position affect elite golfers' lead wrist kinematics. Previous research has shown that ball position influences address posture, alignment, and full-body kinematics. However, little research has examined how ball position affects wrist kinematics during the swing, despite its key role in shot precision. This study addresses that research gap by examining lead wrist kinematics across five ball positions during real shots along the A-P direction using motion tracking (Xsens MTw Awinda and deWiz) and a launch monitor (Trackman). Six NCAA Division 1 golfers will perform three shots per ball position (± 2.14 cm and ± 4.28 cm from the neutral position) using their own 7-iron. To reduce the effects of adaptation, the order of the shots is randomized. The dependent variables are the roll, pitch and yaw maximum angular velocities in the lead wrist. For statistical analysis, one-way ANOVA and post-hoc tests will be used to identify significant variables. The expected outcome is

that ball positions closer to the body will lead to reduced wrist angular velocity due to a smaller swing arc. The results will provide insights into optimal ball positioning and, in turn, help golfers and their coaches make more informed set-up decisions. Additionally, the study provides sports scientists with data on how subtle setup variations influence complex motor patterns. By targeting the underexplored relationship between A-P ball position and wrist kinematics, this study helps bridge a gap in the understanding of elite golf swing kinematics.

Keywords—Golf, wrist kinematics, biomechanics, ball position.

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<mark>BR_2_T3</mark> / UG-S / Early phase

AccountMe: Personal Finance & Budgeting Application by Utilizing OOP Programming.

Utilizing object-oriented programming principles, this project is to assess users' financial obligations and develop a personal budgeting system while providing an estimate of federal tax payment. To achieve this, the application will be developed using a programming language that supports OOP for this instance we will be implementing java for this instance. OOP will be ensuring scalability, ease of maintenance for this instance. The motivation for this project is to start the development of a practical application that helps individuals who face the challenges of budgeting and managing their finances.

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<mark>PL_2_T7</mark> / UG-S / In-progress SURF research

Undergraduate Research's Impact Reaches Washington D.C.

The Scholars' Transforming Through Research program by the Council on Undergraduate Research is a program for undergraduate researchers to learn about the importance of advocacy. Not only did we receive training on how to interact with lawmakers, their staff, and the media, but we also had the incredible opportunity to go inside congressional office buildings and meet with Texas congressional staff members. We were advocating on behalf of undergraduate research for our institution, our state, and ultimately our nation. It was thrilling to imagine that we were all there for the same purpose: to promote the enhancement and continuance of undergraduate research because of how it enriches education, develops competent individuals, increases creativity and knowledge, and fosters growth and discovers new ideas that impact everyone's life in a beneficial way. We were able to have a deeply meaningful conversation about how research and education is being impacted in SETX at this very moment in time and we were able to dive deeper into how Lamar University is impacted by undergraduate research and

federal funding opportunities. I am so thankful to have had this experience, and I hope Lamar University continues to send teams to participate in the Scholars Transforming through Research program. This wonderful opportunity was sponsored and made possible by many at Lamar University including Dr. Cristian Bahrim, Director of the Office of Undergraduate Research and Dr. Shannon Jordan, Chair of the Health and Kinesiology Department, Interim Chair of Nutrition, Hospitality, and Human Services.

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Checkmate: A Classic Computing Program.

This project explores core concepts of Java and Object-Oriented Programming through the development of a fully functional chess game. The goal focuses on applying theoretical knowledge to a real-world application to strengthen foundational programming skills. Using Eclipse IDE alongside online resources, the project applies OOP principles such as inheritance, encapsulation, and polymorphism to manage game mechanics and piece behaviors. A 2D matrix structures the chessboard, while Java's Abstract Window Toolkit and Swing libraries create an interactive graphical user interface. The game allows legal piece movement, recognizes check and checkmate scenarios, and provides a reset function to replay the game. Although formal data collection does not apply, continuous testing and debugging refined the application's performance. The completed program demonstrates how OOP and interface design work together in building a dynamic, user-friendly system. This hands-on experience deepens technical proficiency, improves problem-solving skills, and offers a strong foundation for future software development and engineering projects.

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Improving the Construction Permitting Process in SETX through Technological Integration.

This research investigates methods to improve the construction permitting process in Southeast Texas (SETX), focusing on enhancing efficiency, accessibility, and user experience. The study began with a literature review of residential and commercial permitting procedures to understand current workflows, regulatory structures, and common roadblocks. A detailed process flowchart was created to visualize the permitting process and identify areas of inefficiency. Based on this foundational work, a survey and focus group instruments were developed to gather feedback from contractors. While Institutional Review Board (IRB) approval is pending, initial outreach confirmed contractor interest for future pilot testing. Basically,

this past two semester's of research was to build the foundation for the SURF summer research, where we plan on gathering data and later applying said data into a functional solution. To conclude, this study's objectives are to develop policy and technical recommendations that streamline the permitting process, which promotes economic growth in the region.

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PL_1_T2 / GR-S / In progress URG project

A Comparative Study of Monopole Antennas Using Various Simulation Methods.

Monopole antennas, commonly used in wireless communications, are known for their simplicity and effectiveness, but their performance can be significantly affected by the shape of the surface on which they are mounted. Convex surfaces, which can represent part of the exterior surface of an aircraft fuselage, a missile or a space station in aerospace applications, modify radiation patterns of antennas placed on them. This research aims to provide a comparative analysis of antenna simulation methods by focusing on electromagnetic behavior of monopole antennas mounted on convex conducting surfaces. The study will apply different simulation techniques to model and evaluate performance of monopole antennas in such environments. By using the electromagnetic simulation software, FEKO, the research will present limitations in predicting radiation patterns of monopole antennas on convex conducting surfaces.

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PL_2_T2 / UG-H / Early phase URG Project

Speech-Language Pathologist and Health Advocate: Disclosure of Aphasia.

Effective medical disclosure is essential in healthcare, particularly for health advocates working with individuals who experience communication disorders. However, challenges such as high caseloads, time constraints, and complex medical terminology often hinder clear and effective exchanges between the caregiver and health professional. This study examines how SLPs disclose medical conditions to health advocates, emphasizing barriers, communication strategies, and interdisciplinary education. Findings highlight the importance of simplified terminology, narrative-based medical disclosure, and patient-centered storytelling in bridging communication gaps.

Keywords: speech-language pathology, health advocacy, aphasia.

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Trust Talk End to End- to – End Encrypted Messaging.

In the digital world where communication is everything and data our privacy is under threat all time, Trust Talk is a project designed to empower the users with secure, and fast messaging through end- to – end encryption. Most of the mainstream platforms offer limited to the users and control them under trust Talk aims to redefine digital privacy by building an encrypted messaging such Advanced Encryption Standard. Unlike the traditional massaging apps, Trust Talk ensures that only the sender and recipient can access the message, and no third party can assess it includes the service provider. The application also includes features like secure login, encrypted cloud message storge and people to people message deliver all built using Java and Object-oriented programing and cross platform and security. This project showcases how reliable encryption, multi-threading and client server centered messaging platforms. Trust Talk is more than just a secure app.

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Shaping Cities: Understanding the Impact of the Great Migration on Cultural Freedom.

The Second Great Migration was a transformative period in African American history, characterized by the mass relocation of Black individuals from rural, agricultural settings to urban centers. This movement, driven by the pursuit of freedom and better opportunities, reshaped the social, cultural, and political fabric of the United States. As Black people migrated, they sought to escape the oppressive conditions of the South and redefine their lives in new metropolitan environments. From 1940 to 1970, Philadelphia, PA, experienced significant changes as a result of this migration. The influx of Black residents not only altered the city's demographics but also necessitated a redefinition of community and public space. The transition to urban life required adjustments in how shared values were communicated and how public spaces were utilized. Despite the promise of freedom, many Black migrants faced continued discrimination and uncertainty, challenging their quest for true liberation.

This paper explores the impact of the Second Great Migration on cultural freedom, focusing on the interplay between place, space, and geography. It examines the pressures faced by Black individuals to navigate new environments while maintaining their cultural identity. The analysis draws on the concept of Afrocentricity, which advocates for centering African cultural experiences and displacing Eurocentric

thought (Mazama, 2001). The migration is framed as a search for a decentered mentality, questioning whether true freedom can be achieved when moving from one oppressive context to another.

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Predicting Future Deforestation Hotspots Using Deep Learning and Satellite Images.

This project focuses on early deforestation detection through satellite imagery analysis, leveraging machine learning to quantify and visualize deforestation trends. Data for this study comprised NDVI (Normalized Difference Vegetation Index) values calculated from satellite images, complemented by geospatial attributes including distance maps and segmentation masks. These datasets were meticulously preprocessed to create a comprehensive deforestation dataset, referencing temporal NDVI differences to capture forest changes over time.

The methodology utilized a multi-task deep learning model with two branches—one for segmentation and another for regression. The segmentation branch predicts deforested areas at a pixel level, while the regression branch estimates the overall percentage of deforestation. NDVI differences served as primary input features, enhanced by distance maps for spatial context. Training was conducted on diverse forest regions, and model performance was validated against ground-truth data extracted from segmentation masks.

The results demonstrated robust model performance, achieving accurate pixel-level segmentation and close alignment between predicted and ground-truth deforestation percentages. Heatmaps overlaid on satellite images effectively highlighted areas at risk of deforestation, enabling visual interpretation of model outputs. This technique proved effective in identifying early signs of deforestation.

In conclusion, this project underscores the value of combining remote sensing with deep learning for environmental monitoring. The model's ability to predict deforestation trends and highlight vulnerable areas has significant implications for conservation efforts, offering a scalable tool for real-time monitoring and proactive intervention. It provides a foundation for expanding deforestation studies across diverse ecosystems.

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Preparing Future Educators with Engaging Port Education & Activities.

This study explored how preservice elementary teachers develop their understanding of port-related activities and vocabulary, through a series of pre-, mid, and post-assessments combined with hands-on learning experiences. The study compared their progress in both knowledge and confidence in teaching and learning port related vocabulary and activities. Findings suggest that the future educators significantly improved their knowledge and understanding of port-related concepts, equipping them with the skills needed to simplify complex ideas and engage their students effectively. By integrating real-world applications and problem-solving into lesson plans, the study also encouraged active learning and deeper student engagement. Future research will explore whether preservice teachers successfully apply their new knowledge in the classroom, particularly through STEM-based activities and experiments.

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BR_1_T3 / UG-S / In progress
Faculty Sponsored

Extracting Observables from *Trajectum*, a Heavy-Ion Collision Model.

Trajectum is a state-of-the-art heavy-ion collision model which simulates the evolution of high-energy collisions of atomic nuclei, known as events, allowing users to extract dynamical characteristics of the high-temperature, high-density nuclear medium created in such collisions. Such a model can be used to investigate the evolution of the nuclear medium in different spaces of the QCD phase diagram. In this study, we use *Trajectum* to investigate Au+Au $\sqrt{(s\_NN)}$ = 200 GeV collisions, a collision system studied at the Relativistic Heavy-Ion Collider at Brookhaven National Laboratory. From this model, we determined the speed of sound and the effective temperature. These observables provide information about the relationship between thermodynamic state variables (pressure, temperature, and energy density) in the nuclear medium.

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BR_1_T4 / GR-S / Advanced
Faculty Grant Research

Matrix-Free Linear Algebra for Trajectory Optimization.

Mathematical optimization is a powerful tool for solving complex problems in science and engineering. A particular application of interest is trajectory optimization, which seeks to find the best path for a system to follow over time. In this talk, we discuss matrix-free linear algebra that scales trajectory optimization to large discretizations. Unlike the traditional notion of sparsity in which matrices are stored as arrays of

index-value pairs, we consider linear algebra that avoids the instantiation of large, unwieldy matrices altogether. To illustrate this idea in the context of trajectory optimization, we focus on spectral collocation discretizations. Although these discretizations produce linear operators with dense matrix representations, collocating at the Chebyshev-Lobatto points permits us to apply these operators "faster than we can write them down". That is, with respect to the size of the discretization, applications of the operator scale almost linearly while sizes of the matrices representing the operators scale quadratically. We present a new preconditioner that extends these fast applications to fast matrix-free linear algebra. We then incorporate that linear algebra into an optimization framework to solve a low-thrust orbit transfer problem with millions of unknowns. This solve is faster than its matrix-based counterpart, even when the latter has orders of magnitude fewer unknowns.

Presenter: Carolyne Tarver [$]   BR_7_T4 / GR-H / Advanced
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Becky with Good Hair? The Perpetuation of Eurocentric Dating Preferences, Black Women & Contemporary Dating Shows.

This thesis examines perceptions of the portrayal of Black women in contemporary reality dating/romantic television shows, emphasizing the persistence of Eurocentric beauty standards and harmful stereotypes. In this thesis, I examine these stereotypes: Jezebel, Angry Black Woman, The Strong Black Woman, and The Rejected Black Woman, which I refer to as the "not my type" archetype/image. My research is significant for several reasons, including filling in the gap where previous literature surrounding reality TV, dating shows, and their impact on Black women was scarce. My research incorporates 25 interviews with Black women to examine audience reception towards representation and images associated with Black women in dating reality shows. In addition, the study utilizes cultivation theory and social learning theory to frame the study and interpret the results or perceptions of racial dating preferences and representation of Black women in reality dating TV. The data illustrated that Black women are highly media literate and may not internalize most media that portrays/treats Black women negatively. However, there was a high level of critiques for dating shows, especially regarding more diverse representation of Black women. Overall, I explore Black women's perceptions of reality dating TV, proving how racism and misogyny impact Black women through all forms of culture and society.

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Landing Mechanics and Muscle Activation in Modern Dancers.

Previous literature has largely focused on ballet dancers and their risk of lower extremity injury. Even though modern dancers differ from ballet dancers in their body movements and biomechanical demands, few studies exist addressing modern dance. This study will utilize multiple tests for postural instability and pair it with a measurement of muscle activation (EMG) to gain insight into postural instability in modern dancers. Previous studies addressing modern dance have not paired these tests with electromyography (EMG). This study integrates postural instability assessments with EMG to analyze muscle activation in modern dancers. Utilizing Functional Movement Screen (FMS) protocols and movement tests, it identifies muscular deficits and informs the strength and conditioning recommendations to prevent lower extremity injuries in modern dancers. To date, five participants have been fully assessed, ranging in age from 20 to 35 years. Of these, three were recreationally active individuals and two were trained modern dancers. Only one participant met the criteria for the single-legged broad jump test. Preliminary findings indicate that dancers may stabilize more quickly following landing compared to non-dancers. However, these results are only preliminary, and additional data analysis is necessary to draw more definitive conclusions.

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PL_1_T7 / UG-S / In progress
Beck fellowship

Advancing Protein Downstream Tasks through Pre-trained Large Language Model Representations.

Crotonylation, a lysine-based post-translational modification, regulates key cellular processes and is linked to diseases like cancer and Alzheimer's. Identifying lysine crotonylation sites in DNA-binding proteins is crucial for understanding abnormal protein behavior in cancer. Large language models (LLMs), pretrained on protein sequences, have shown promise in protein specific tasks like structure and function prediction. In this study, we investigate the effectiveness of Protein Language Models (pLMs) in addressing two significant bioinformatics problems. The first problem is prediction of crotonylation sites, essential for protein function. We use embeddings from the pLM ProtT5-UniRef50-XL, utilizing full protein sequences as input. These embeddings are processed through a Multi-layer Perceptron (MLP) classifier to predict crotonylation sites, resulting in the CrotT5-MLP model. The second problem involves predicting DNA/RNA binding proteins, formulated as a multi-label classification task to predict DNA and RNA binding proteins simultaneously. Protein-level representations are generated using average pooling on ProtT5 embeddings, and an MLP is employed as the classification head to assign binding labels, referred to as DNA-RNA-T5-MLP.Leveraging pLMs, we obtain robust representations directly from protein sequences, automating the prediction tasks and eliminating the need for handcrafted features. This approach reduces manual effort and offers cost-effective alternative to traditional, lab-intensive methods. Additionally, I would like to acknowledge the support of Dr. Jane Liu (Lamar University) and Dr. Dukka KC (Rochester Institute of Technology) for their immense guidance. I sincerely thank Lamar University's David J. Beck Fellowship Program and the Office of Undergraduate Research (OUR) for their generous financial support in this research.

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Changing the Index of Refraction of Silica Glasses.

The index of refraction is a measure of the optical response of a transparent material. This can be explained by understanding the interaction between light and matter. One intuitive approach is by considering the harmonic oscillations of dipoles that form bulk matter to the E-field of the incident light. Changing the environment which surrounds a material can effectively modify its index. One efficient way is by changing the environmental temperature. This shifts the wavelength by an amount that can be approximated by the equation $hc/\lambda' = hc/\lambda + kT$ (h is Planck's constant, c the speed of light, k is Boltzmann constant). This happens in the Earth's atmosphere and can lead to interesting optical effects. The physics of light matter interaction with our atmosphere elegantly explains them. Experiments using the fundamental principles of light-matter interaction has been carried out in our Optics Lab. Our experiments of dispersion of light use the Cauchy – Lorentz model for harmonic oscillatory dipoles. Experiments using thin films on crown and flint glasses of triangular prims shape, and discharge tubes that can model the sunlight are reported. We simulate the change in temperature kT with an applied voltage U = eV set up across the glass, and measure changes of refractive index due to an isotropic increase in the energy environment, kT = eV, equivalent with the equation for the conservation of energy described above. Our experiments are done below the opacity wavelength of silica glasses with an electron density of ~1029 cm-3 and dipoles oscillating with periods of 3 to 4 x10-16 seconds.

Presenter: Evan Wolford [$]

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Mentor: Mr. Andre Favors [$]

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Censorship? An Analysis of Discourses of Three Kendrick Lamar Performances.

Method: This research explores the complex identity trajectory of mixed-race individuals in Southwest Louisiana, tracing their evolution from being recognized as Free People of Color with African ancestry in the early 19th century to increasingly identifying as white in contemporary society. Beginning in the early 1800s after the Louisiana Purchase, the legal and social frameworks established during this period for the people known as Redbones created distinct racial classifications that impacted the lives of these mixed-race people. Historical records indicate that these individuals often navigated a fluid social landscape, utilizing various strategies to assert their identities in response to systemic racism and shifting societal norms.

Data Collection: The study analyzes key historical events, legislation, and cultural shifts that contributed to the transformation of racial identity. By employing a mixed-methods approach, combining interviews,

legal records and newspaper accounts with historical analysis, this research highlights narratives that illustrate the challenges and successes faced by mixed-race individuals.

Results: The findings reveal a significant pattern of assimilation over generations, shaped by socio-political factors and a desire for social mobility.

Conclusions/Implications: Ultimately, this research underscores the importance of understanding racial identity as a dynamic and evolving construct, influenced by historical context and personal agency. The journey of mixed-race people in Southwest Louisiana serves as a case study for broader discussions on race, identity, and belonging in America.

Presenter: <mark>Ramona Young</mark> $ <mark>BR_5 & 6_T5 /</mark> UG-H / In progress
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A Vertigo of Fear: Hitchcock's Psychological and Technical Mastery of Stairs and Falling.

This study examines Alfred Hitchcock's unique cinematic approach to stairs, falling, and their intersection as visual and narrative devices in his films. Using a qualitative research method, this study analyzes Hitchcock's filmography to explore how he transformed everyday elements like staircases into psychological tools that evoke suspense and fear. Data collection involved a detailed review of key scenes from iconic films such as Vertigo, Psycho, and Notorious, alongside Hitchcock's own commentary on his techniques.

Results of the analysis reveal that Hitchcock used stairs not only to advance the narrative but also as metaphors for psychological states—representing transitions, turmoil, or foreboding. His frequent use of falling as a visual motif tapped into universal fears, creating a visceral connection with audiences. The study also highlights Hitchcock's technical innovation, such as pioneering the dolly zoom in Vertigo, which visually replicated the sensation of falling and profoundly impacted filmmaking techniques.

In conclusion, Hitchcock's use of stairs and falling exemplifies his mastery of "pure cinema," where visuals convey deeper psychological and symbolic meaning. His ability to transform mundane elements into sources of tension redefined cinematic language and continues to influence filmmakers. This study underscores Hitchcock's enduring legacy as a director who reshaped how visual storytelling can evoke fear and emotion, making his films timeless explorations of human psychology.

Presenter: <mark>Fakir Sheik Zihad</mark> $ <mark>BR_4_T5 /</mark> GR-S / In progress
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Mentor: **Dr. Yueqing Li** $

**Co-authors**: Md Shariful Islam [$], Zobayer Eusufzai [$], and Md Asif Karim [$]
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Comparison & Validation of Statistical Method for Forecasting Industrial & Residential Water Demand Using Machine Learning.

Predicting daily household water consumption is a critical step toward sustainable resource management, yet it requires balancing accuracy, interpretability, and computational efficiency. This research outlines a dynamic machine learning framework to predict water consumption, encompassing data refinement, feature creation, and model comparison. Initial efforts focused on transforming raw datasets by converting descriptive categories, like household characteristics, into numerical formats. Key predictors—such as time-based markers, past usage trends, and smoothed averages—were developed to reflect cyclical shifts and long-term behaviors. Two predictive tools were tested here. First Linear Regression model for foundational insights and a Random Forest Regression for enhanced precision through collective decision-making. Performance was gauged using error metrics (MAE and RMSE) alongside variance-explained measure (R^2), ensuring a balanced evaluation. The chosen model delivered reliable predictions, spotlighting usage irregularities and trends that empower water stewards and residents alike. This study bridges practical simplicity with analytical depth, offering a scalable solution for water management for both Industrial & Residential purposes.

Thank you, oral presenters!
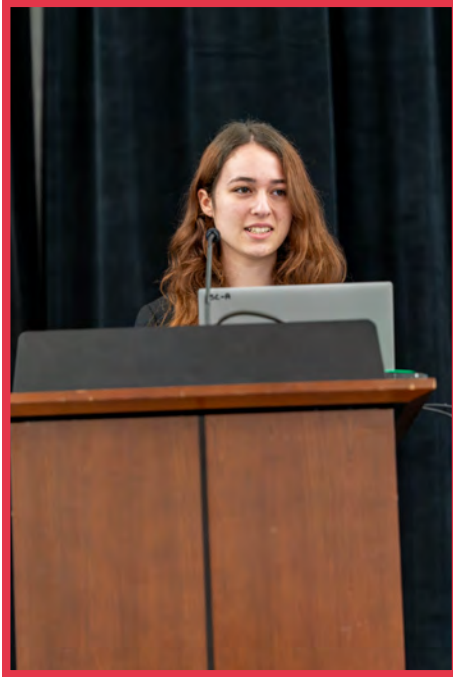
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Presentations

Glossary:

- **GR** means Graduate student.
- **UR** means Undergraduate student.
- **UG-H** means Undergraduate student in HASBSEB area.
- **UG-S** means Undergraduate student in STEM area.
- **SURF** means Summer Undergraduate Research Fellowship.
- **URG** means Undergraduate Research Fellowship (at Lamar University)
- **H**– **Humanities, Arts, Social and Behavioral Sciences, Education, and Business**
- **S**– **Science, Technology, Engineering, and Mathematics**

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Presenter: Julia Adams [$]

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Petro-structural analysis of mylonite in the Memve'ele Shear Zone, Southern Cameroon.

Mylonitic rocks form in shear zones and are characterized by microstructures that serve as crucial indicators of shear kinematics and stress variations during deformation. This study integrates optical petrology with electron probe microanalysis and scanning electron microscopy to investigate the microstructural evolution of mylonites from the Memve'ele Shear Zone in the Ntem Complex of the Congo Craton.

Preliminary observations reveal complex kinematic histories marked by both sinistral and dextral shear indicators, reflecting large-scale, diverse strike-slip motion. These movements were influenced by regional diapirism and transpressive horizontal shortening during craton assembly. Microstructural features such as rotated and fractured delta and sigma-type porphyroblasts suggest a progressive transition from sinistral to dextral shearing. While shear polarity remains consistent along mylonitic foliation planes, it varies across different schistosity orientations. Hydrothermal fluid flow assisted the later dextral shearing, as evidenced by veins and veinlets associated with dextral movement.

Intermediate mineral compositions contributed to both ductile and brittle deformation, forming a full assemblage of proto-mylonite, mylonite, and ultra-mylonite in the shear zone. Mylonitic amphibolites (sulfide- and calcite-bearing) and pyroxene-bearing TTG (tonalite-trondhjemite-granodiorite) gneisses suggest deformation under upper amphibolite facies conditions, driven by medium temperature and pressure metamorphism. This study analyzes the kinematic indicators recorded in the microstructures of these mylonites to decipher the sense of shear which characterized the formation of the Memve'ele Shear Zone and contribute to a broader understanding of cratonic development in the Congo Craton.

Presenter: <mark>Oreoluwa Adeleke</mark> [$]
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Mentor: **Dr. Kayunta Johnson-Winters** [$]
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Spectral Characterization and Substrate Promiscuity of F420-Dependent Glucose-6-Phosphate Dehydrogenase from Nocardia brasiliensis.

F420-dependent glucose-6-phosphate dehydrogenase (FGD) plays a key role in bacterial redox metabolism by utilizing the F420 cofactor, a unique two-electron hydride carrier involved in tuberculosis treatment, folate biosynthesis, antibiotic biosynthesis, and energy production. This study investigates the spectral characteristics of F420 and the substrate specificity of FGD from Nocardia brasiliensis. The oxidized cofactor exhibits strong absorbance at 420 nm, while the reduced form shows a shoulder at 320 nm. To characterize FGD, we cloned, expressed, and purified the enzyme in E. coli, followed by kinetic assays to assess its substrate range. Unlike its more selective bacterial counterparts, FGD from N. brasiliensis displayed unexpected promiscuity, acting on glucose-6-phosphate, D-mannose-6-phosphate, and D-fructose-6-phosphate. This finding challenges assumptions about its conserved active site and suggests novel enzymatic flexibility. Future kinetic and structural studies will probe the molecular basis of this substrate promiscuity. By deepening our understanding of FGD's biochemical properties, this research contributes to its potential applications in antibiotic biosynthesis and pro-drug activation.

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Advancing G-Quadruplex Sensing: Development of High-Sensitivity Fluorescent Probes.

Guanine-rich secondary DNA structures, known as G-quadruplexes (G4s), play critical roles in gene regulation, genomic stability, and cancer pathogenesis. Due to their structural polymorphism and high prevalence in telomeres and oncogene promoters, G4s have emerged as promising targets for cancer diagnostics and therapeutics. This study aims to develop high-sensitivity fluorescent probes capable of real-time detection and stabilization of G-quadruplex structures. We explore various classes of G4-targeting probes—including polycyclic aromatic hydrocarbons, carbocyanines, flavonoids, and pyridinium salts—highlighting their chemical interactions and fluorescence signaling mechanisms. These structural activity relationships direct to improve specificity, selectivity, and aqueous solubility include enhancing π–π stacking interactions, groove binding, and metal ion coordination. Real-time visualization of G4 structures facilitates a deeper understanding of their biological functions, which remain only partially understood. Despite recent advancements, current probes face challenges such as narrow emission spectra, low quantum yield, low stoke shift, poor solubility and cellular infiltration, low selectivity, and

limited real-time detection capabilities. Flavonoids are water soluble natural products and exhibit anti-cancer activity through multiple molecular mechanisms. Therefore, in this study we proposed flavonoid based dual fluorescence probe with improved photophysical characteristics. The continued development of such dual-targeting probes and optimized ligand architectures holds great promise for improving cancer diagnostics and therapeutic interventions.

Presenter: Brayan Alonso-Prieto [$]   **Poster_11** / UG-S / Advanced
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Mentor: **Dr. Minkyum Kim** [$]
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Impact of Back-Assist Exosuits on Productivity, Physical Capability, and Health Outcomes in Construction Work.

Construction work is physically demanding, often leading to musculoskeletal injuries, particularly in the lower back. Back-assist exosuits have been developed to alleviate strain and enhance worker performance, yet their effectiveness in real-world construction settings remains underexplored. This study evaluates the impact of back-assist exosuits on productivity, physical capability, and health outcomes among construction workers.

A two-phase methodology is employed: a comprehensive literature review and experimental testing. The literature review brings together existing research on exosuit benefits and challenges, including productivity gains, injury risk reduction, and potential limitations such as discomfort and mobility restrictions. The experimental phase involves controlled lifting tests conducted at Lamar University's Recreation Center, where participants perform repetitive lifting tasks with and without an exosuit. The thing that was measured was task completion time and were recorded and analyzed for later evaluation.

This study aims to determine whether exosuits enhance efficiency and reduce physical strain without compromising worker comfort. If proven effective, exosuits could serve as a viable solution for reducing workplace injuries and extending career longevity in the construction industry. However, challenges such as adaptation and cost must also be considered. The findings will contribute to a deeper understanding of exosuit applications in construction and their role in improving worker safety and productivity.

Presenter: Gabriel Apatu [$]   **Poster_15** / GR-H / In progress
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Mentor: **Dr Christina Gregory** [$]
[$] Department of Political Science, Lamar University

LGBT Inclusion in the Military: A Comparative Study of Policies and Practices in The Netherlands and The United Kingdom.

According to Goodhart and Taylor (2020), the United States of America is still grappling with the challenge of fully integrating LGBT inclusion in the US military. While President Obama removed all restrictions on lesbians, gays, and bisexuals (LGB) personnel there continue to be restrictions on transgender personnel within the Department of Defense (DoD).

While America faces challenges with the LGBT issue, Europe may have advanced in finding a clear path to including LGBTs fully in their militaries. European countries dominate the first 20 places on the LGBT Military Index with 16 countries (Polchar, Sweijs, Marten and Galdiga, 2014). Polchar et al (2014) find as European countries have become more accepting of the LGBT community, they have embraced policies allowing LGBT to serve openly in their militaries. The study found the existence of evidence to link social acceptance to these societies' attitudes to military policies, which further confirms the relationship between public opinion polling on homosexuality and the acceptance of LGBTs in the military.

The main research question is: "How have shifts in public opinion affected the ability of gays to openly serve?" I will use process tracing to conduct a comparative case study on the Netherlands and the United Kingdom to understand the relationship between social acceptance and societal attitudes toward military policies and the military personnel's level of tolerance and acceptance of colleagues who are LGBT as it relates to cohesion in service.

Presenter: <mark>Madeleine Izaguirre Arostegui</mark> [$]
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Mentor: **Dr. Alex Peniche** [$]
[$] Galveston Community College

Analyzing Presence of Staphylococcus Aureus and Epidermidis in Gym Equipment Samples by Using Polymerase Chain Reaction.

Gymnasiums are crowded spaces where biological material can be exchanged through skin contact. This study aims to assess the presence of Staphylococcus aureus and Staphylococcus epidermidis on gym equipment surfaces at the Galveston College Fitness Center, using acid-based assays such as polymerase chain reaction (PCR). A total of 36 samples were collected from various gym machines and accessories, swabbed, cultured within 48 hours, and then subjected to DNA isolation for PCR analysis. The results revealed the presence of 16S gene in 35/36 samples, suggesting microbial communities interacting with the environment. However, Staphylococcus aureus was absent in all samples (0/36), indicating it does not pose a significant threat for gym users and staff. On the other hand, Staphylococcus epidermidis was detected in 2/36 samples, representing 5.56% of the total. Although typically considered a commensal bacterium, S. epidermidis can pose a risk to individuals with weakened immune systems. This study was funded by the Galveston College STEM Honors Program through an NSF grant.

Presenter: <mark>Julio Delgado</mark> [$]
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Mentor: **Dr. Yueqing Li** [$]

Co-authors: Lisa Brooks [$], M A Masud Khan [$], and Pujan Maharjan [$]

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Analyzing Variations in Texas Public High Schools Using Student Success Metrics Pre- and Post-COVID-19 Through Data Mining.

The COVID-19 pandemic caused unparalleled disruption in various sectors of society. Without a doubt, the COVID-19 pandemic affected the education sector. This project utilizes data mining techniques to analyze the impact of the pandemic on student success rates in Texas public schools at the high school. Using quantitative data primarily from the Texas Education Agency's (TEA) Academic Performance Reports (specifically comparing 2018 pre-pandemic data to 2024 data), this study aims to quantify variations in student success indicators following the pandemic's peak. Key variables examined include STAAR pass rates, graduation and dropout rates, college readiness metrics, attendance, AP/IB and SAT/ACT participation and performance. Data preprocessing will involve extracting and normalizing numerical values. Data mining techniques such as K-Means Clustering, Decision Tree Classification, and Logistical Regression Analysis will be employed to identify performance patterns and predict high school success or failure based on defined criteria. Recommendations based on potential findings include targeted STEM initiatives and attendance incentive programs. Future research directions involve expanding the time scope, incorporating machine learning for predictive analysis, and investigating long-term remote learning effects. Continuous monitoring using future TEA data is recommended to track the recovery of the Texas public education system.

Keywords: COVID-19, Texas public schools, education, data mining, student success, TEA reports, pandemic impact.

Presenter: Brianna De Jesus [$]   Poster_41 / UG-S / Early phase

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Mentor: **Dr. Nevin Weinberg** [$]

[$] Department of Physics, The University of Texas at Arlington

Modeling Thermonuclear Explosions on the Surface of Neutron Stars.

The crux of astrophysics research is that the physics experienced on Earth is the same as that observed in deep space. Advances in our understanding of physics, together with improvements in technology and instrumentation, inform our observations of stellar phenomena and help us refine models of the universe. An exciting example of this are Type I X-ray bursts, which occur on the surfaces of accreting neutron stars (dense remnants of massive stars formed from core-collapse supernova explosions). The intense gravitational pull of the neutron star draws in material (accretion) from an orbiting companion star. As this material accumulates, it undergoes rapid fusion at extreme temperatures and pressures (thermonuclear burning), leading to a bright, explosive flash that emits mostly in X-ray wavelengths. Since their discovery more than 50 years ago, X-ray bursts have provided valuable insight into neutron star structure and fundamental physics. The present research highlights recent advances in X-ray burst research and the impact these findings have on future scientific inquiries. These allow scientists to confirm and streamline scientific models of the universe and further fundamental physics research, including the dynamics of the strong nuclear force.

Presenter: Allison Deras [$]   Poster_8 / UG-H / Advanced URG project

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Mentor: **Priyanka Jaisinghani** [$]

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Classroom Seating Preference and Auditory Capabilities in Students with Hearing Loss.

Students with hearing loss in higher education face unique challenges, particularly in selecting classroom seating that maximizes their auditory capabilities and academic success. This study investigates the seating preferences of students with hearing loss based on their auditory abilities and compares these preferences with those of students with typical hearing.

METHOD: Fifteen students diagnosed with hearing loss undertaking any level of course in Lamar University were recruited in the target group. A mix of students who use hearing aids, cochlear implants, and those not using any hearing devices were recruited. 38 students with typical hearing and undertaking any level of course in Lamar University were recruited as a control group. All the participants participated in an online survey consisting of three parts. Part A consisted of demographic questions, while Part B assessed various aspects of classroom seating preferences. Part C comprised of questions from the Speech, Spatial and Qualities of Hearing Scale - 12 item version (SSQ-12) questionnaire to assess hearing abilities in everyday situations.

RESULTS: The SSQ-12 scores and seating preferences will be compared across the two groups and the relationship between the SSQ-12 scores of target group with seating preferences will also be assessed. The study findings will aid in understanding how seating preferences of students with hearing loss or typical hearing vary with auditory capabilities.

Presenter: Thomas Duong $

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Mentor: **Dr. Jeong-Mi Yoon** $

$ Department of Mathematics and Statistics, University of Houston - Downtown

Poster_34 / UG-S / In progress
Independent reseach

Markov Chain Model in Ecological COVID-19 Infection Analysis.

Predicting the trajectory of COVID-19 infections is crucial, especially given the initial lack of prior knowledge about the disease. In the absence of comprehensive historical data, mathematical modeling serves as a valuable tool for public health professionals to analyze and understand the dynamics of disease spread. In this project, we employ a Markov Chain Model to study the behavior of the COVID-19 survival system. The long-term behavior of a Markov Chain is often analyzed through its steady-state equilibrium, where the probabilities of different health states stabilize over time. Our model begins with a simple three-state system, representing non-infected individuals, infected individuals, and hospitalized patients. We then extend this model to include additional states to account for more complex situations. We use real-world data from Houston to run simulations to analyze infection dynamics. The calculations and simulations are implemented in Python. This project provides insights into the potential long-term trends of COVID-19 spread and can aid in public health decision-making.

Presenter: <mark>Paige Frederick</mark> [$]

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Mentors: **Dr. Kole Kubicek & Dr. Matt Hoch** [$]

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Assessment of a Man-made Dredge Placement Compartment as a Supplemental Nursery Habitat on the Texas Shoreline of Sabine Lake.

Estuaries along the Gulf coast provide nursery habitats (e.g., seagrass beds, coastal marshes) which serve as a refuge for larval and juvenile fishes and invertebrates and are therefore essential in maintaining the ecological integrity of marine ecosystems. The Texas shoreline of Sabine Lake has been heavily altered by hydrological diversions, ship channels and revetments resulting in a greatly reduced connection between the estuary and the surrounding marshland nursery habitat. Despite this, there was a highly productive, local recreational fishery located on Pleasure Island, Port Arthur, Texas that was centered around a dredge material placement area enclosed within the island revetment. The enclosed compartment consisted of open water habitat with emergent vegetation along much of the perimeter and maintained a connection with Sabine Lake via tidal flow through two sets of large diameter pipes, allowing organisms to move freely between the two. We aim to determine if this manmade enclosure served as an important nursery habitat for juvenile fishes and invertebrates along the highly modified Texas shoreline of Sabine Lake. To accomplish this, we conducted population inventories using otter trawls, bag seines and gill nets following the methods of the TPWD Coastal Fisheries Division over the course of a year. The data collected from these surveys was compared to that collected by TPWD for the Sabine Lake System to determine if there is a significant difference in the community assemblage of juveniles within the north levee enclosure compared to the surrounding estuary, including 10 species known to utilize nursery habitat.

Presenter: <mark>Angel Griffin</mark> [$]

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Mentor: **Dr. Mamta Singh** [$]

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Digging Deeper: The World of Accommodation & Participation Through the Workings of Preservice Teacher.

The purpose of this study is to evaluate preservice teachers' abilities to incorporate adequate accommodation and opportunities for social interaction within their lesson and unit plans. The study assessed three-unit plans, each consisting of five sequenced lesson plans developed by preservice teachers. The findings suggest that 72% of preservice teachers were somewhat effective in providing adequate accommodation and descriptions. Additionally, 50% of the lesson plans were either somewhat effective or inadequate in facilitating social interaction and participation. Future studies should focus on

providing additional training for preservice teachers on creating accommodation and fostering social interactions in lesson plans.

Presenter: <mark>Jonah Gigliotta</mark> $

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Mentor: **Dr. Masud Rana** $

$ Department of Computer Science, Lamar University

MovieRecommender: Modernized Movie Recommender System Using C++.

This paper will explain and explore a movie recommender system that suggests movies the user would prefer by using C++ to recommend or pick movies the user would probably like. The program will choose movies based off a selection of tags that that movies are labeled with that the user selects.

Presenter: <mark>Caleb Gregory</mark> $

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Mentor: **Dr. Rafael de la Madrid** $

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Numerical Calculation of the Energies and the Decay Energy Spectra of Quantum Mechanical Resonances.

In quantum mechanics, unstable states (called resonances) decay spontaneously. Such decays are characterized by their energies and spectra. In this proposal, we intend to develop a numerical procedure to calculate the energies and the decay spectra of quantum mechanical resonances. Through the use of the Fortran and Matlab we were able to find how accurate the experimental calculation of Oxygen-17 was.

Presenter: <mark>George Guy</mark> $

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Mentor: **Dr. Minkyum Kim** $

Co-authors: Bryce McMorris $, Jacob Perales $, and De'asia Nickerson $

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Advanced Technologies and Its Growing Role in Modern Construction.

The construction industry is undergoing a massive transformative shift driven by recent advancements, namely the monumental rise of Artificial Intelligence. The purpose of this paper is to provide a comprehensive analysis of AI-driven technologies that are currently being integrated slowly but surely into our industry. Several topics, such as machine learning, predictive analytics, AI-powered Drone technology,

generative design, and 3D printing are discussed along with their applications across the various stages of construction, from the Preconstruction phase to the final stages of Safety and Quality inspection. This study utilizes peer-reviewed published literature, case studies, and industry reports as provided by Lamar's Library. In addition, as it was relevant to the topic, ChatGPT was used as a digital research assistant to aid in summarizing the data of the literature and reports to reflect the very technology under discussion in this paper.

The research highlights a growing body of literature and increasing momentum around AI integration in the construction industry, with ongoing work exploring its application in the broad spectrum of the various phases of construction. Research is continuing in examining how effectively AI-driven tools can analyze construction data, generate relevant data and inspection documents, and possibly even produce visual models to support decision-making in the industry. As AI becomes more accessible and accepted, it promises to redefine construction practices through increased automation, enhanced cost-efficiency, improved safety, and long-term sustainability.

Presenter: **Maggie Ha** [$]   **Poster_35** / UG-S / In progress
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Mentor: **Dr. Jeong-Mi Yoon** [$]
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Mathematical Analysis for Double Pendulum System.

The double pendulum is a classic example of a nonlinear dynamic system that exhibits complex chaotic behavior. Modeling the double pendulum involves the motion of two masses connected by rigid rods, with one pendulum suspended from the other. The equations of the system are derived based on the second law of Newton, resulting in a set of two nonlinear differential equations. These equations describe the angular positions and velocities of the two masses. It is still an open problem of how to solve for the exact solutions of these nonlinear equations. However, under certain assumptions, we can linearize these equations near equilibria and derive them into two linear differential equations that can be solved for exact solutions. In this project, after finding the exact solutions for the linearized system, we run some simulations for the non-linear system on a computer system MATLAB by applying Runge-Kutta method.

Presenter: **Miriam Hernandez** [$]   **Poster_24** / UG-S / Early phase
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Kinetics of Oxidation using Spectroscopy methods.

Understanding the oxidation kinetics of carbon steel is critical for advancing forensic investigations involving firearms. To determine if oxidation-related changes may be accurately identified and measured using spectroscopy techniques including Ultraviolet-Visible (UV-Vis), Infrared (IR), and X-Ray Fluorescence

(XRF), this study focuses on the corrosion behavior of 1095 carbon steel. The goal is to provide a reliable, scientific technique for detecting and tracking oxidation on carbon steel.

This study addresses a fundamental need in forensic science the ability to accurately assess the environmental and chemical transformations that occur on a firearm over time. By examining the progression of rust formation, we aim to enhance current forensic methodologies and contribute to the development of standardized analytical protocols for temporal estimation and surface analysis in firearm-related investigations. In the early stages of this research, a chemical solution was prepared using 150 mL of hydrogen peroxide, 5 g of salt, and 2 mL of acetic acid to simulate and accelerate the corrosion process. Two pieces of 1095 carbon steel were immersed in the solution for one hour, and changes were observed and recorded every 10 minutes. This controlled setup allowed consistent monitoring of visual and physical corrosion changes over time.Initial results indicate progressive surface oxidation within the first 30 minutes, with visible rust formation and surface texture changes. These findings were obtained using spectroscopy methods such as infrared (IR) and X-ray fluorescence (XRF), to detect and quantify specific stages of oxidation, with future analysis aimed at confirming these techniques for forensic application..

Presenter: Jannatul Hur [$]
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Enhancing Learning Efficiency and Ergonomic Well-Being: A Comparative Study of Handwritten, AI-Assisted, and Digitally Structured Notetaking.

How one takes notes in today's hectic learning environment can affect one's learning capacity, including memory retention, lead to physical stress, and even fatigue. This is especially evident in study sessions where students sit for hours. So, how a student dictates his notes could show better or worse results of efficacy. Thus, this research aims to decipher which notetaking technique best balances learning effectiveness and physical comfort. The team will analyze three popular approaches: digital notetaking via tablets, AI-generated notes, and conventional handwriting. Each note-taking technique is allocated to engineering graduate student participants in the study. After viewing a 30-minute instructional video and taking notes using the prescribed approach, students will complete a quick survey and quiz to measure their mental effort. The team will also inquire about physicality- posture, hands, and neck. After a day, a second quiz will assess their memory of the previous activity. The goal is to find an approach that achieves the best efficacy with the least physical and mental stress. This research could help students, teachers, and workplaces gain better focus techniques, understanding, and well-being. Analyzing the brain and body in tandem brings a fresh perspective on how we learn. Discovering ways to take exceptional notes is not the only aim. Still, taking notes in ways that promote the best results and mitigate any potential mental or physical strain for anyone involved is pertinent.

Presenter: <mark>Cassandre Jusmable</mark> [$]

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Mentor: **Dr. Lene H. Petersen** [$]

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American Alligator (Alligator mississippiensis) Hematology.

This study investigates the hematology of the American alligator (Alligator Mississippians) through the examination of blood smears, providing valuable insight into reptilian red and white blood cells (RBC, WBC) and potential abnormalities. Alligators are able to sustain significant injuries without infection and their immune system is therefore of interest to aid in production of antibiotics/antiviral medicines for human use. Samples were collected from live alligators at various venipuncture sites, including the tail vein, abdominal cavity, and regions near the heart. This sampling technique allowed for clean (no contamination) and "unclean" (potential contamination with organ bacteria) analyzes. Blood smears were stained using the Giemsa stain and analyzed under a microscope that was connected to a camera and imaging software. The primary aim of this research was to enhance understanding of the alligator immune cells and evaluate possible differences in immune cell numbers and/or appearance between humans and alligators. Of interest, was the presence of sickle-shaped cells in alligators as well as presence of potential (but unidentified) blood parasites in alligators. Key differences in RBCs included the presence of a nucleus and oval shape of RBCs in alligator red blood cells which are not seen in humans.

This research not only expands knowledge of reptilian hematology but also contributes to broader discussions of evolution, physiology, and comparative pathology and can assist in developing medicines that can aid in human infections.

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EmployeeManager: Modernizing Employee Information and Payroll System.

This program will primarily facilitate the process of tracking employee payroll. To ensure every employee gets paid appropriately, it is imperative to have a flawless tracking system that will manage their payroll and have accurate information on the person. The Java program will use several programming techniques to achieve this desired outcome including inheritance, exception handling, and polymorphism. The use of these techniques will ensure a robust yet flexible code that can be expanded upon with future developments. The program will keep track of employee information including attendance and payroll. Users will be able to add or remove employees as well as modify their

information. Each employee will have a name, contact information, address, and payroll information. The contact information of the person stored in the system will allow employers or managers to inform them of any changes to their pay or other information. The attendance tracker will also be on record as evidence justifying less pay and such. It is important for employers and employees to have a fair system in place, especially when it comes to pay. This is important to me because accurate pay is fair for all parties involved. Hopefully, this project will be perfected to reach the vision of a system that will allow for fairness for all parties involved, prevent issues related to pay from occurring, and allow for future developments.

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Optimizing Acid-Free Clearing and Double Staining for Small Vertebrate Skeletons.

The study of vertebrate skeletons is crucial for understanding their anatomy, development, and evolution. Clearing and Double Staining (C&S) is a widely used technique that makes tissues transparent and highlights skeletal structures, enabling researchers to examine cartilage (blue) and bone (red) without sectioning. C&S is particularly effective for studying small vertebrates like fishes and amphibians. Traditional C&S protocols use acidic solutions, which can decalcify bones in tiny specimens, compromising bone staining quality. An acid-free protocol using magnesium chloride ($MgCl_2$) instead of glacial acetic acid has been proposed to address this. However, it has only been tested in zebrafish (Danio rerio) at a single developmental stage. This study aims to optimize C&S methods for the early life stages of vertebrates by testing the effects of both staining time and concentration of $MgCl_2$ in acid-free cartilage staining solution and their impact on the quality of cartilage and bone staining in multiple species. Results showed that lower concentrations of $MgCl_2$ led to excessive uptake of alcian blue in unintended tissues of smaller specimens, while larger specimens were less affected. The results also showed that longer staining durations increased cartilage staining intensity in the same unintended tissues across all sizes. Regardless, of the concentration or duration in the cartilage staining solution, the bone staining remained unchanged.

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Plastic Nanoparticles in Soil.

It is understood that microplastics are great harm for both the environment and the health of humans. I have been conducting research to better understand the impact and to see if there are better ways to

minimize the amount that can be found in common places such as soil and natural water sources. My research so far has been to find trace amounts of plastics in soil by extracting the organic bilayer using density separation. With the organic material, I can run a myriad of tests against the standard of polystyrene. This will help me identify any similarities. Using the results I can quantify the amount of plastic material found in my soil sample and theorize from there how to extract nanoparticles of plastic found.

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Designing a unique fruit-harvesting robotic manipulator to reduce damage to fruits, leaves and trees significantly.

Existing fruit harvesting mechanisms are still mechanical, which damages fruits and trees. So our main concern is developing a robotic picking system that will be able to recognize and locate the fruit for best quality output without damaging fruit or trees. Y. Sarig et al. (1993) mentioned two robots picking oranges with a 75% success rate and apples with a 50% success rate. In both cases, the success rate is still less. Y. Xiong et al. (2019) mentioned the average picking success rate for a single attempt is 53.6% without causing damage to the berries and 59.0% when including "success with damage" in the natural situation. The struggle is picking clusters of strawberries, where both the detection and the gripper struggle to separate the strawberries. M. Campbell et al. (2022) mentioned a leaf retrieval mechanism that can capture 69.2 percent leaves and only 10.25% (4/39) of viable leaves that are clean-cut.

Now the challenge is creating a smaller efficient faster manipulator. So, my idea is to create a unique small fruit-picking manipulator that will easily reach and capture the fruit and have a pouch to hold some fruits. At the end of that pouch will be an automatic gate mechanism to drop the fruit when it reaches the receiver. The mean success rate will be measured for different fruits and necessary changes to the design will be made to achieve around 95% success rates in small picking time and 3D point cloud system will be used for detection.

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Mixed Reality in Training.

Over the past few years, augmented and virtual reality technologies have been utilized in education, entertainment, manufacturing industries, and in training the purpose of an individual to engage the user in an interactive environment. To enhance the user experience in this emerging field, various studies has been done using mixed reality which blends (AR/VR) applications by creating realistic simulations that

replicate real-world, high-risk, and complex scenarios leading to skill acquisition, physical (muscle) memory development, and enhancing learning experience in a controlled and safe environment. In sectors such as from healthcare to manufacturing, aviation, workshops, and in sports and fitness. This technology offers hands-on practice, adaptive content, and immediate feedback by trainers during or after training. Furthermore, mixed reality reduces the cost and preparation required by traditional training environment and scenarios by reusing it with minimal expenses and modification. Despite the advantages of mixed reality, this technology is still facing difficulties in adaptation due to high setup cost, special content development for training, and user adaptation. However, ongoing development in hardware and software are making MR platform implementation more feasible and accessible to users. As technology continues to evolve, mixed reality integration into training programs will enhance the learning outcome, bridge the gap between physical and virtual training, and foster innovation in instructional design.

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EShop: Building a Scalable E-Commerce Shopping Cart to Digitalize Purchase.

We all have problems with shopping experiences, such as prices not showing, and purchases not happening. So, this project aims to develop a shopping cart for a dressing shop that uses HTML, CSS, JavaScript, and Django with Python programming language to make a complete and easy-to-navigate website for a shop. The project aims to simplify the process of digital purchasing. Django facilitates the backend of this project. HTML, CSS, and JS with React framework are used to design the frontend, so that users who are not very experienced with digital purchasing can still find a way to do it. Hopefully, this project can enhance the building of scalable e-commerce shopping cart to digitalize purchase.

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RecipeHubAPI: Cookie Generator.

This paper helps learn on the concepts of the try, catch, and finally block with a fun way, to give various types of cookie recipes that the user can cook at home. Providing another alternative for fetching recipes that the user does not have to individually search up. In this recipe generator, we look at different components of ingredients that the user will input with their desired preferences to generate a list of delicious recipes that will satisfy the tastebuds. This project will be using exception handling concepts which are prominently used in Object-Oriented Programming (OOP). The resulting picture will help users to understand the relationship between exception handling and OOP. Hopefully, users will garner more

knowledge and understanding of programs that look simple but delve deeper underneath the layers of computer science.

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Material Interfaces: Designing a Smart Productivity Display using OOP Principles, API Integration, and Craftsmanship.

A smart mirror consists of a framed computer screen placed behind a two-way mirror. This two-way material allows light from the screen to pass through, making digital content appear on the mirror's surface. The mirror will display real-time information designed to support daily routines. Using JavaFX, Weather APIs, and Object-Oriented Programming, I strive to create a program that will aid in human routine, with aesthetics, security, and innovation in mind. The mirror will display crucial data such as the current time, calendar, and the local weather conditions. The hope is to integrate technology into everyday life, promoting productivity and efficiency in a modern environment.

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Mary and John Gray Library, Lamar University

Inclusion or Exclusion: The Debate Over Asexuals in Religious Communities.

Asexuality, a sexual orientation characterized by a lack of sexual attraction, has gained increased recognition in recent years. While often misunderstood, asexuality challenges traditional norms of attraction and relationships, positioning it as a unique identity within the spectrum of human sexuality. Interestingly, asexuality finds conditional acceptance within conservative religious communities due to its perceived alignment with celibacy, chastity, and traditional family structures. This study explores how religious values shape the reception of asexuality, analyzing the extent to which it is acknowledged as a valid orientation versus merely tolerated under moral and theological frameworks. The findings reveal that while some religious communities interpret asexuality as fulfilling spiritual ideals, others hesitate to fully embrace it due to long standing expectations surrounding marriage and procreation. Additionally, the research highlights debates over the inclusion of asexuality within the queer community, where differing perspectives shape discussions of identity and acceptance. By investigating both conservative and queer spaces, this study contributes to a broader understanding of the socio-cultural dynamics affecting asexual individuals and their place in diverse communities.

Keywords: asexuality, religion, conservative communities, social acceptance, acceptance.

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The Detection of Escherichia coli in Food Samples Using Polymerase Chain Reaction.

My project was based on the pathogen *Escherichia coli (E. coli).* According to CDC, Escherichia coli *(E.coli)* was responsible for 37 food outbreaks in 2024. I aimed to detect *E. coli* in food samples from vendors in Galveston Island using nucleic acid-based assays such as polymerase chain reaction (PCR). Culturing and staining methods are time-consuming (several days for initial results up to confirmation). Therefore, accurate and fast E. coli detection methods can assess the microbiological status of food and prevent the spreading of infectious agents. Samples (n = 62) from uncooked beef, chicken, and vegetables were swabbed and later DNA isolated to run PCR for methods. Two meat and two produce samples were detected positive for the E. coli glutamate decarboxylase (gadA) gene. Interestingly, produce samples (lettuce and green pepper) were also positive for bfpA (bundle-forming pilus) but not for eae (intimin) virulence genes; indicating contamination with a potential pathogen, that might not be so virulent to cause disease in those consuming the food product. Safety measures such as hand washing, cooking at safe temperatures, and proper refrigeration are essential to prevent outbreaks. The Galveston College STEM Honors program funded this study through an NSF grant.

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Creep Test Rig.

Creep is defined as the rate at which a solid material deforms under constant mechanical stress. It is used in industry to better understand how materials will deform over time. This study focuses on creep behavior of low-density polyethylene (LDPE) with the fire-retardant filler, Magnesium Hydroxide (Mg (OH)2), at 10, 20, and 30% loading. A creep test rig was used to find the strain of these samples along the elastic effects over time. Strain was calculated dividing travel by the initial height of the samples. It is known as conventional creep testing since the results were time dependent. The experimental data was analyzed using the Findley power law model. This numerical method helps find a correlation between creep test and time in the form of a simple equation x=mtn. Furthermore, it divides creep into three phases; phase

2 was the focus of this experiment. The stress of the samples was calculated dividing force applied in successive increments by the cross-section area of sample. The data was used to calculate the material stiffness using Young's Modulus. The findings were graphed as strain vs time using Microsoft Excel and Python to compare the graphing tools. The results obtained from the graphs for each sample containing different amounts of Mg $(OH)_2$ were analyzed to determine the phase 2 creep rate.

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Retardants' Effect on Concrete in Warm Environments.

In construction projects, the premature setting of concrete due to warm weather conditions has become a significant issue, leading to poor-quality concrete with compromised strength and durability. High temperatures accelerate the hydration process, causing concrete to set too quickly, resulting in reduced workability, increased risk of cracking, and potential long-term structural weakness. This premature setting can hinder the proper finishing of the surface and may lead to costly repairs. This research seeks to identify which retarders produce the most consistent, good-quality results across warm environments, ensuring that concrete can be placed, finished, and cured effectively despite high temperatures. Advantages of retarders in Concrete are as follows. Complex concrete placement or grouting. Special architectural surface finish: exposed aggregate finish. Compensating for the accelerating effect of high temperature towards the initial set, preventing cold joint formation in successive lifts. The specific retarders this article will be discussing are Liquid nitrogen, chilled ice water, and Poly G 83-34 high-range water reducer (CHRYSO Optima 249). Data and technical merit in this paper were sourced as follows, reading 21 posted research report papers/ literary reviews online; search engines used were google and Mary and John Gray library filtered by the key words "concrete, retarder, admixture, cure", asking companies and industry experts for current/ to date information, and utilizing personal experience on site with retarder applications. How the reader should analyze the literary review is subject to the purpose and/or intentions of the readers' objective with the data provided in the paper.

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Improving the Construction Permitting Process in SETX through Technological Integration.

This research investigates methods to improve the construction permitting process in Southeast Texas (SETX), focusing on enhancing efficiency, accessibility, and user experience. The study began with a literature review of residential and commercial permitting procedures to understand current workflows, regulatory structures, and common roadblocks. A detailed process flowchart was created to visualize the permitting process and identify areas of inefficiency. Based on this foundational work, a survey and focus group instruments were developed to gather feedback from contractors. While Institutional Review Board (IRB) approval is pending, initial outreach confirmed contractor interest for future pilot testing. Basically, this past two semester's of research was to build the foundation for the SURF summer research, where we plan on gathering data and later applying said data into a functional solution. To conclude, this study's objectives are to develop policy and technical recommendations that streamlined the permitting process to promote economic growth in the region.

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When the Courtroom Becomes the Classroom: Engaging Students in the Transformative Learning Process.

Transformative learning experiences in higher education have become increasingly critical as institutions seek to prepare students for rapidly evolving professional environments. Introduced by Jack Mezirow, transformative learning (TL) articulates a learning process, for post-secondary learners, that results in clear changes in the individual's frame of reference as they move through an active learning process (Mezirow, 2002). Through structured experiential learning opportunities that connect academic concepts with real-world applications, students can develop theoretical knowledge coupled with technical competencies and the broader professional capabilities needed for career success (Pantzos et al., 2023). This research project provided student practicums for students in criminal justice, social work, communication, and education which offered evidence-based experiential opportunities to develop professional skills through the application of access to direct mental health services within the criminal justice system. By utilizing collaborative response programs, educational training and effective communication at all levels, students were able to provide compassionate and cost-effective mental health resources to help keep people out of the criminal justice system when mental health issues present as the primary concern (Dempsey et al., 2020; Gosselin, 2017). Results indicate that throughout this learning process, students developed advanced work-ready skills such as critical thinking, increased awareness of resources and needs, and developing actionable plans with clients.

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An Assemblage Survey of a Highly Productive Recreational Fishery in a Man-made Dredge Placement Compartment in Sabine Lake.

Estuaries along the Gulf Coast provide nursery habitat (e.g., seagrass beds, coastal marshes) which not only serve as a refuge for larva and juvenile fishes and invertebrates but also provide resources for adult individuals of numerous species. This includes many species collected for sport and as a result, these areas often support popular recreational fisheries. The Texas shoreline of Sabine Lake has been heavily altered by hydrological diversions, ship channels and revetments resulting in a greatly reduced connection between the estuary and the surrounding marshland nursery habitat. Despite this, there was a highly productive, local recreational fishery located on Pleasure Island, Port Arthur, Texas that was centered around a dredge material placement area enclosed within the island revetment. The enclosed compartment consisted of open water habitat with emergent vegetation along much of the perimeter and maintained a connection with Sabine Lake via tidal flow through two sets of large diameter pipes, allowing organisms to move freely between the two. We aim to determine if this manmade enclosure served as an important habitat for adult's individuals, including several popular game fishes. To accomplish this, we conducted population inventories following the methods of the TPWD Coastal Fisheries Division over the course of a year. The data collected is compared to that collected by TPWD for the Sabine Lake System to determine if there was a significant difference in the community assemblage within the north levee enclosure compared to the surrounding estuary and what environmental variables may be associated with these differences.

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Effects of Stimulant on Metabolic Pathways.

This study focuses on looking at the effects of a stimulant (caffeine) and an analgesic on the lipids of a plant sample. The purpose of this is to hopefully have a better understanding of how these drugs impact the lipids in humans eventually by using the plants as a reference cell. To conduct this research, two samples of the same plant material were collected, and one sample was treated with a combination of the two drugs, while the other was left untreated to serve as a control. The lipids from both samples were extracted and run through gas chromatography. The results are expected to show a change in the metabolic pathway due to the addition of the stimulant.

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CFD Modeling of Methane Gas Release from an Underground Pipeline in Different Soil Types (Silt, Sand, and Gravelly).

Subterranean pipelines are crucial for transporting natural gas and light hydrocarbons globally, but these pipelines carry the risk of ruptures that can release hazardous materials, leading to severe financial and human consequences. Effective consequence modeling necessitates a deep understanding of gas flow dynamics and its atmospheric escape to develop robust preventive and mitigation strategies.

This research focuses on developing a computational fluid dynamics model in ANSYS Fluent to simulate the flow of gas from ruptured subterranean pipelines, addressing the critical need for better safety measures. By integrating advanced modeling techniques in ANSYS Workbench, the study aims to predict gas flow regimes such as diffusion, fluidization, and crater formation under various Soil conditions. The model will be validated with experimental work conducted by Yan et al. and assessed for its ability to predict methane concentrations and flow behaviors. This work provides a valuable tool for understanding and mitigating the risks of underground pipeline breaches in oil and gas facilities.

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Polypropylene Solutions and Metal Oxides in the Presence of Living Cells for Surgical Settings.

The goal of this research is to evaluate whether specific metal-polymer combinations are suitable for use in professional and biomedical applications, including surgical environments. We began by gently heating and dissolving 2g of polypropylene in 200 mL of toluene. While the sample dissolved, our metal oxide was prepared using 0.1g of Magnesium with 10 mL of ethanol, followed by sonication to ensure dispersion. Once the metal oxide was finished and the polypropylene/ toluene solution was fully dissolved and cooled, they were then cast. A sample was cast on two mediums: one uses water as a standard and another uses Magnesium oxide. In the presence of magnesium oxide, there was visible crystallization. The sample was then taken for analysis through DSC and IR testing.

In our future research, we plan to prepare additional samples to be cast and analyzed to observe similar interactions with the polymer and metal oxide. Additionally, we hope to introduce the compound to living cells in hopes of positive growth. Positive cell growth in the presence of the polymer and metal oxide compound would suggest potential in medical or surgical application.

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Search for *Escherichia coli* Under Shoes.

E. coli is a bacterium that is present in everyday life. It is commonly looked for in food samples to check if the food is safe enough to eat either cooked or uncooked. *E. coli* can come from fecal matter, which is present in bathrooms, farms, animal waste, etc. Not all strains of *E. coli* are harmful to humans. There are strains that are symbiotic to humans such as EcN which contribute to the human gut biome. Strains that are virulent such as ETEC, EPEC, EAEC, and EIEC can cause symptoms such as diarrhea. This prompted the question of whether *E. coli* could be found on the bottom of shoes that frequent similar environments, then can be transmitted onto surfaces that small children could encounter, such as the floors of homes. For this study, 37 shoes from random subjects have been swabbed to collect the DNA present on the shoes. After the DNA was isolated from samples PCR was made to test for gada gene (glutamate decarboxylase enzyme encoding gene, specific for *E. coli*). Currently there have been positive samples for bacteria (16s) and *E. coli (gada).* Further testing will be done to determine whether any of the positive *E. coli* samples contain strands of *E. coli* that are dangerous to humans.

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Predicting Crotonylation Sites and DNA/RNA Binding Proteins: A Machine Learning Approach for Understanding Abnormal Protein Behavior in Cancer.

Crotonylation, a lysine-based post-translational modification, regulates key cellular processes and is linked to diseases like cancer and Alzheimer's. Identifying lysine crotonylation sites in DNA-binding proteins is crucial for understanding abnormal protein behavior in cancer. Large language models (LLMs), pretrained on protein sequences, have shown promise in protein specific tasks like structure and function prediction. In this study, we investigate the effectiveness of Protein Language Models (pLMs) in addressing two significant bioinformatics problems. The first problem is prediction of crotonylation sites, essential for protein function. We use embeddings from the pLM ProtT5-UniRef50-XL, utilizing full protein sequences as input. These embeddings are processed through a Multi-layer Perceptron (MLP) classifier to predict crotonylation sites, resulting in the CrotT5-MLP model. The second problem involves predicting DNA/RNA

binding proteins, formulated as a multi-label classification task to predict DNA and RNA binding proteins simultaneously. Protein-level representations are generated using average pooling on ProtT5 embeddings, and an MLP is employed as the classification head to assign binding labels, referred to as DNA-RNA-T5-MLP.Leveraging pLMs, we obtain robust representations directly from protein sequences, automating the prediction tasks and eliminating the need for handcrafted features. This approach reduces manual effort and offers cost-effective alternative to traditional, lab-intensive methods. Additionally, I would like to acknowledge the support of Dr. Jane Liu (Lamar University) and Dr. Dukka KC (Rochester Institute of Technology) for their immense guidance. I sincerely thank Lamar University's David J. Beck Fellowship Program and the Office of Undergraduate Research (OUR) for their generous financial support in this research.

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Gender Equality Blueprint: How Culture Affects Our Relationship With FML.

Despite decades of progress in gender equality, wage disparities persist across OECD countries. This study investigates how cultural attitudes shape the effectiveness of Family Medical Leave (FML) policies in reducing the gender wage gap. Analyzing cross-national data, the findings reveal that policy implementation alone is insufficient—cultural readiness plays a crucial role. Countries with long-standing leave policies but traditional gender norms, such as South Korea, continue to experience high wage gaps, while those with progressive attitudes, like Norway, see greater gender parity. These results emphasize the need for policymakers to move beyond legislative measures and invest in cultural transformation strategies, such as promoting paternity leave uptake and challenging gender stereotypes in workplaces. Addressing the intersection of policy and culture is essential for achieving sustainable gender equality.

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The effects of temperature differential within Hot Mix Asphalt at Construction.

This investigation examines the effects of temperature differentials in Asphalt at construction with regards to the longevity and resulting performance of the pavement. The goal was to figure out the effects of the specific temperature or range of temperatures that have a noticeable effect on the pavement. The research employs field evaluations of certain temperature differential (TD) spots, where distress indicators

are systematically monitored, to gain a better understanding of what those spots are telling us. The team used samples of the asphalt from the segregated and non-segregated areas to compare them in the lab. Comparing these samples against a variety of other conditions to figure out exactly what the cores and the areas around them are saying. Information gathered from these assessments unequivocally shows that temperature disparities of more than 25°F correlate with higher amounts of air voids. This means that the finished product is more likely to be compromised. These initial findings are crystal clear: temperature-related construction issues are directly responsible for paving that won't last. The results stress the significance of strict temperature control during construction. They indicate that current regulatory guidelines need to be improved to better manage the risk of temperature nonuniformity. By connecting temperature differences with pavement performance, this research provides clear and useful evidence for improving construction practices. In the end, we hope that it lays a foundation for extending the lifespan of pavements, improving roadway safety, and possibly saving money by reducing the amount of maintenance that is necessary.

WORKSHOPS – Dr. Masud Rana

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W_1 / GR-S / Early phase

A Robust Phishing Attack Detection System Using Random Forest, XGBoost and KNN.

Phishing attacks have become a serious threat to online safety, tricking users into giving away personal and sensitive information through fake emails or malicious websites. As phishing methods become more sophisticated, it's crucial to develop reliable detection systems that can identify these threats in real-time. This project focuses on building an effective phishing detection system using a blend of machine learning techniques two advanced algorithms, Random Forest and XGBoost, along with a basic algorithm, K-Nearest Neighbors (KNN).

Random Forest, known for its robustness, uses multiple decision trees to boost accuracy and handle large datasets efficiently. XGBoost takes it a step further by leveraging gradient boosting, making predictions more precise through iterative improvements. On the other hand, KNN, a simpler yet effective method, classifies phishing instances based on how closely they match known data points.

To create a comprehensive detection model, we collected data from various sources, including phishing and legitimate websites, and extracted relevant features such as URL patterns, email characteristics, and web attributes. After data cleaning and processing, we trained the models to spot phishing attempts while minimizing false positives.

Our approach combines the power of advanced algorithms with the simplicity of KNN to create a balanced and accurate phishing detection system. The results indicate that our model performs well in identifying phishing attacks, offering a practical tool to enhance cybersecurity and protect users from online fraud.

Presenter: <mark>Ram Charan Naik Banavathu</mark> $

Major: Computer Science

Email: rbanavathu@lamar.edu

Mentor: **Dr. Masud Rana** $

$ Department of Computer Science, Lamar University

CREDITRISKML: Credit Risk Prediction using Logistic Regression and XGBoost.

This study presents the CREDITRISKML, a machine learning-based system for credit risk prediction using Logistic Regression and XGBoost. The objective is to classify loan applicants as high-risk or low-risk, enabling financial institutions to make more informed lending decisions. The methodology involves applying supervised learning techniques on a labeled dataset containing information such as income, credit score, loan amount, employment status, and repayment history.

The dataset used to study sourced from publicly available financial datasets, commonly used in credit scoring benchmarks. It underwent preprocessing steps including handling missing values, label encoding for categorical features, and feature scaling to ensure optimal model performance.

Two models Logistic Regression and XGBoost were trained and evaluated. Logistic Regression offered a baseline due to its simplicity and interpretability. XGBoost, a gradient boosting framework, was employed to enhance predictive accuracy through advanced regularization and ensemble learning.

The results show that XGBoost significantly outperformed Logistic Regression in terms of accuracy, precision, recall, F1-score, and AUC-ROC. This indicates its effectiveness in capturing complex patterns and reducing misclassification rates in credit risk prediction.

In conclusion, the study demonstrates that machine learning, particularly XGBoost, can be a powerful tool for credit risk assessment. The implementation of such models can help financial institutions reduce default rates, improve loan portfolio quality, and support data-driven decision-making processes.

Presenter: <mark>Navya Surya Ratnam Bolisetti</mark> $

Major: Computer Science

Email: nbolisetti@lamar.edu

Mentor: **Dr. Masud Rana** $

$ Department of Computer Science, Lamar University

Predicting Customer Churn with Machine Learning: Enhancing CRM Strategies through Advanced Algorithms.

Customer churn prediction is essential for managing relationships and retaining members, especially within student organizations. While commercial CRM systems like Salesforce and Dynamics 365 offer built-

in churn prediction features, they often lack customization tailored to educational settings. This project aims to fill that gap by developing a predictive model specifically designed for student organization CRMs. The model leverages advanced machine learning algorithms, including XGBoost, LightGBM and HistGradientBoostingClassifier, to accurately predict member disengagement.

The project follows a structured approach, beginning with data collection from CRM systems that include engagement metrics, support ticket records, and interaction histories. After data preprocessing and feature engineering, the model is trained to detect members at risk of leaving. To address the unique needs of student organizations, custom metrics such as Engagement Score and Support Ticket Ratio are incorporated, enhancing prediction accuracy.

During the evaluation phase, model performance is measured using accuracy, precision, recall, and F1-score to ensure reliability. XGBoost and LightGBM offer robust and efficient predictions, while HistGradientBoostingClassifier enhances adaptability and learning from data patterns. Once the most effective model is identified, it will be deployed as an API within CRM systems, allowing real-time churn prediction.

By integrating the model directly into CRM workflows, student organizations can proactively identify at-risk members, enabling more targeted and effective retention strategies. This tailored approach addresses the limitations of generic CRM solutions, providing a practical tool for enhancing student engagement and retention.

Presenter: <mark>Arun Epparla</mark> $ W_4 / GR-S / Early phase
Major: Computer Science
Email: aepparla@lamar.edu
Mentor: **Dr. Masud Rana** $
$ Department of Computer Science, Lamar University

HEALTHML: Disease Prediction using Decision Trees and Random Forest.

The rapid advancement of machine learning (ML) technologies has opened new frontiers in the field of healthcare, particularly in disease prediction and diagnosis. Accurate and early detection of diseases is vital to initiating timely treatment and improving patient survival rates. This project, titled HEALTHML, explores the use of two popular supervised machine learning algorithms—Decision Trees and Random Forest—for disease prediction based on patient data, including symptoms, demographic information, and medical history. These algorithms were selected due to their effectiveness in classification problems and their ability to handle large datasets with both categorical and numerical variables.

The Decision Tree algorithm is known for its simplicity and interpretability, allowing healthcare professionals to understand and trace the model's reasoning for a specific diagnosis. However, individual decision trees may suffer from overfitting and reduced accuracy on unseen data. To overcome this, the Random Forest algorithm is introduced as an ensemble method that builds multiple decision trees and combines their outputs to improve predictive performance and generalization. It also ranks the importance of features, helping identify key symptoms contributing to specific diseases.

The data set used in this study was sourced from public medical databases and contains information about various diseases and associated symptoms. After preprocessing, the data was split into training and testing

sets, and the models were evaluated using metrics such as accuracy, precision, recall, and F1-score. Experimental results demonstrated that Random Forest consistently outperformed the standalone Decision Tree in terms of accuracy and robustness.

HEALTHML highlights the potential of machine learning to support clinical decision-making, reduce diagnostic errors, and enhance the overall efficiency of healthcare systems.

Presenter: Md Shafaqul Islam Hamim [$]
Major: Computer Science Engineering
Email: mhamim@lamar.edu
Mentor: Dr. Masud Rana [$]
[$] Department of Computer Science, Lamar University

W_5 / GR-S / In progress

Advanced Machine Learning Techniques to train models to detect Network Intrusion Detection.

In this age of interconnected world, keeping the network infrastructure safe from malicious activities is very important. This study presents a Network Intrusion Detection System (NIDS) that utilizes machine learning algorithms for efficient anomaly and cyber-attack detection. The three high-level algorithms utilized in the research are Isolation Forest, Autoencoders, and Support Vector Machine (SVM) with RBF Kernel, applied to traffic data from the KDD Cup 99, UNSW-NB15, and CICIDS 2017 datasets. The datasets are composed of normal and attack traffic and provide a comprehensive ground for model comparison. The Isolation Forest algorithm is used for unsupervised anomaly detection with the main goal of isolating anomalous instances. Autoencoders use deep learning to reconstruct input data and detect anomalies based on reconstruction error. The SVM model is used as a supervised learning method to differentiate between attack and normal traffic. The study concludes that deep learning methods provide a robust solution for intrusion detection but at the cost of higher computational requirements. The findings emphasize the necessity to select appropriate machine learning techniques based on the specific characteristics of network traffic data.

Presenter: Adam Mai [$]
Major: Computer Science
Email: amai1@lamar.edu
Mentor: Dr. Masud Rana [$]
[$] Department of Computer Science, Lamar University

W_6 / UG-S / Early phase

The Identification of Numerical and Alphabetical Characters through Machine Learning.

This purpose of this document is to showcase how machine learning can be used to interpret numbers and letters. The methodology of machine learning this paper will use is the Decision tree and SVM. This paper will also explain in detail why the decision tree and SVM is used, and how they have operated. The data set this paper will be using is yet to be determined. The conclusion of this paper will show the result of such machine learning, and the process of how this project will end up.

Presenter: <mark>Mahbuba Moumita</mark> $
Major: Computational and Quantitative Methods
Email: mmoumita@lamar.edu
Mentor: **Dr. Masud Rana** $
$ Department of Computer Science, Lamar University

BrainTumorML: Evaluating, Analyzing, and Recommending ML Models for Early Brain Tumor Detection in MRI Imaging.

Detecting brain tumors at an early stage plays a significant role in enhancing patient survival rates. This research aims to evaluate and compare the effectiveness of three distinct machine learning models—Random Forest, Artificial Neural Networks (ANN), and Convolutional Neural Networks (CNN)—for classifying brain tumors using MRI scans. The study utilizes a well-known Kaggle dataset containing labeled MRI images of gFlioma, meningioma, pituitary tumors, and non-tumor cases. Data preprocessing steps involve resizing the images, normalizing the pixel values, and converting the labels into a one-hot encoded format. The models are then trained and evaluated on this dataset, with performance assessed based on accuracy, sensitivity, and specificity metrics. While Random Forest is expected to excel due to its robustness with complex data, ANN is expected to offer advantages in identifying non-linear patterns, and CNN, being particularly designed for image data, is anticipated to achieve superior performance by extracting spatial features. Logistic Regression will be used as a baseline model for comparison. This study aims to demonstrate the utility of various machine learning models in the classification of brain tumors and contribute to the advancement of AI technologies in medical diagnosis and early detection.

Presenter: <mark>Meet Arvindbhai Monpara</mark> $
Major: Computer Science
Email: mmonpara@lamar.edu
Mentor: **Dr. Masud Rana** $
$ Department of Computer Science, Lamar University

## Stock Price Prediction Using Machine Learning Regression Models.

This is a project in predicting EUR/USD price using regression algorithms The data is collected from a CSV with structured formats, using important indicators such as open, high, low, and volume values. After a few preprocessing steps such as normalization of column features and removal of NaN values, the data was split into training and test sets, with the last 50 rows of information used to evaluate the performance of our model on unseen results. A total of three machine learning algorithms were deployed: Linear Regression, Random Forest Regressor, and K-Nearest Neighbors Regressor (KNN). Feature scaling was applied via normalizing for algorithms sensitive to data scale, such as Linear Regression and KNN. All models were trained on this training set and tested on the test set. The performance metrics were Mean Squared Error (MSE), Root Mean Squared Error (RMSE), and R^2 Score. All three had strong predictive performance, and while Linear Regression had the highest R^2 score (0.96+) this was closely followed by Random Forest and KNN. The consistency of the predictions (especially in stable price regions) was confirmed using visual comparisons of actual vs predicted values. Above all, learners can achieve good performance in currency price short-term prediction using a simple set of market features. This indicates that regression models should be included in financial analytical workflows and establishes a foundation

for introducing further developments, including time-series modeling or deep-learning techniques for better long-term predicting power.

Thank you, poster presenters!
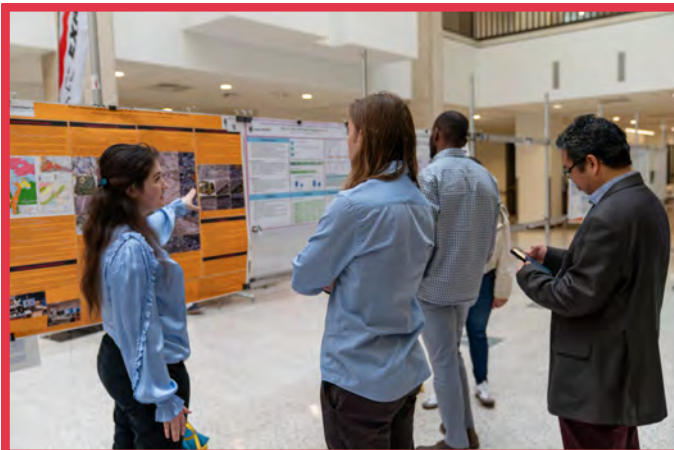
GET YOUR MASTER'S DEGREE IN THE UK!

Alyce Myers is a Regional Representative with Durham University (UK) based in Austin, TX. She will be giving a presentation at the Lamar University Undergraduate Research Expo about how students can receive their master's degree or PhD in the UK. During her information session, she will explain the differences in the US vs. UK higher education system, the postgraduate application processes, funding opportunities, and life in the UK.

Durham University was founded in 1832 as the third oldest university in England and is a Russel-Group Research-Intensive university. The university currently has over 20,000 students with 130 postgraduate programs. Durham is ranked a top 10 university in the UK, a top 100 university in the world, is a collegiate university, and is top five in the UK for team sport.

Alyce Myers

International Officer
Durham University

Scan here to learn more about Durham University!

📍 **Ballroom A&B**

📅 **April 23rd and 24th**   🕐 **1:00 pm- 1:15 pm**

🌐 durham.ac.uk   @ durhamuniversity   📍 The Palatine Centre Stockton Rd. Durham DH1 3LE

Durham University

GET YOUR MASTER'S DEGREE IN THE UK!

Alyce Myers is a representative with Durham University (UK) regionally located in Austin, TX. She will be giving a presentation at the Lamar University Undergraduate Research Expo on Wednesday, April 23rd where students may learn more about receiving their master's degree or PhD at Durham.

Durham University was founded in 1832 as the third oldest university in England and we are a Russell Group research-intensive University. The university currently has over 20,000 students with 130 postgraduate programs. Durham is ranked a top 10 university in the UK, a top 100 university in the world, is a collegiate university, and is top five in the UK for team sport.

Alyce Myers

North America International Officer

Scan here to learn more about Durham!

📍 Sabine I

📅 Wednesday, April 23rd   🕐 2:30 pm- 4:00 pm

🌐 durham.ac.uk   @ durhamuniversity   📍 The Palatine Centre Stockton Rd. Durham DH1 3LE

Under Pressure! SETX Short Narrative Films Under Constraint: Communication & Media Short Film Showcase

Wednesday, April 23, 2025 1:15-2:00 in Setzer 125 and 127
Moderator: Andre Favors

Student Panelists: Adan Baeza, Dalia Osman, Shane G. Brown, Heather Harmon, and Anysia Rincon.

In this panel discussion, LU and TALH students will screen short narrative films that were made under time and/or budgetary constraint. Three of the films were made as part of the Boomtown Film and Music Festival's 48 hour film race. The screenings will include:
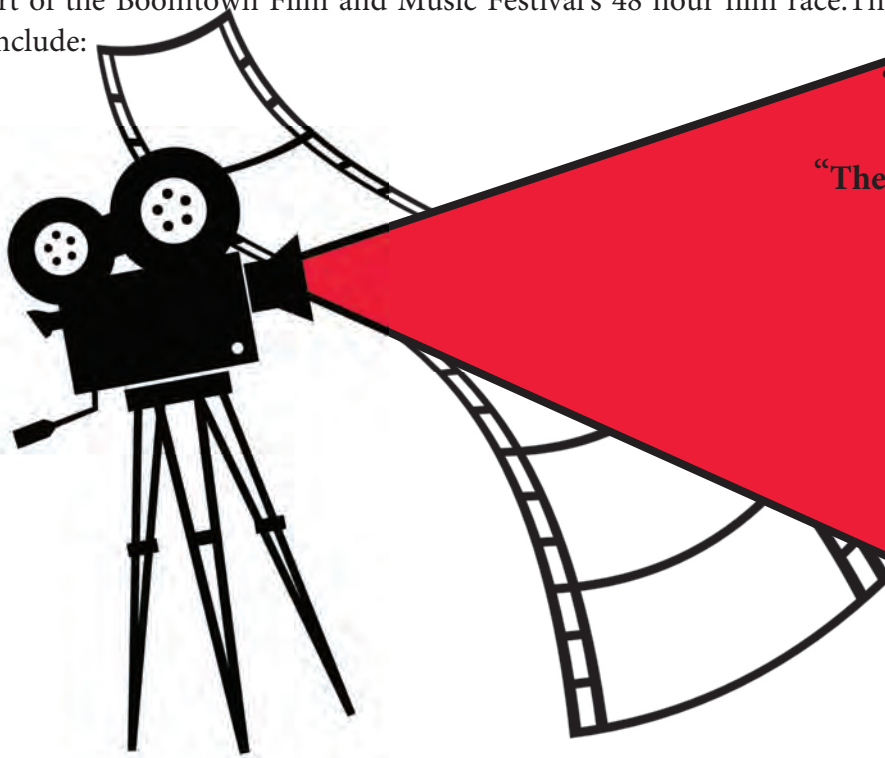
"**Reaper**" Dir. by A. Rincon and A. Baeza

"**The Tale of Jack McCree**"
Dir. by D. Osman

"**I Didn't Do It**"

Dir. by I. Duerksen and S. G. Brown

"**Geeks**"

Dir. by A. Rincon and H. Harmon

The directors and/or those involved in the films will introduce their films and the moderator will lead a discussion of their work after the screenings. A Q&A session with the audience will be included.

The directors are past and present members of Red Beak Productions which is an LU student organization of passionate filmmakers and creatives continually seeking opportunities to work to improve themselves and their craft. Any LU student is welcome to join the organization, if you are interested please contact the president of Red Beak Production Adan Baeza (abaeza@lamar.edu).

OFFICE OF UNDERGRADUATE RESEARCH
LAMAR UNIVERSITY

RED BEAK
PRODUCTIONS

VANISHING GOVERNMENT INFORMATION

Why It Matters & What You Need To Know

April 23 2025

1:15pm–2:15pm

Recent actions have altered the availability of and access to digital government information that students and faculty rely on to complete assignments, write papers, or produce research. Come to this workshop to:

- 🔍 Learn how recent actions affect gov. info. access.
- 🔍 Identify resources for accessing archived gov. info.
- 🔍 Identify resources for maintaining awareness.

All Disciplines Welcome

MARY AND JOHN GRAY LIBRARY
LAMAR UNIVERSITY

ALL COLLEGE DISCIPLINES ARE INVITED!

O.U.R. EXPO 2025
RESILIENCY THINK TANK

The LU Resiliency Think Tank is an intellectual sandbox where students from different disciplines collaborate to create innovative, interdisciplinary responses to homelessness in Southeast Texas.

Join us for a student panel discussion on creating a space for collaboration, learning, and community impact through service and outreach projects.

RESILIENCY THINK TANK COMMUNITY ENGAGEMENT

Pocket Pal Resource Guide
Jessica Gomez, Family Studies

Housing Summit at The Samaritan Inn
Clansi Montes, Nutrition

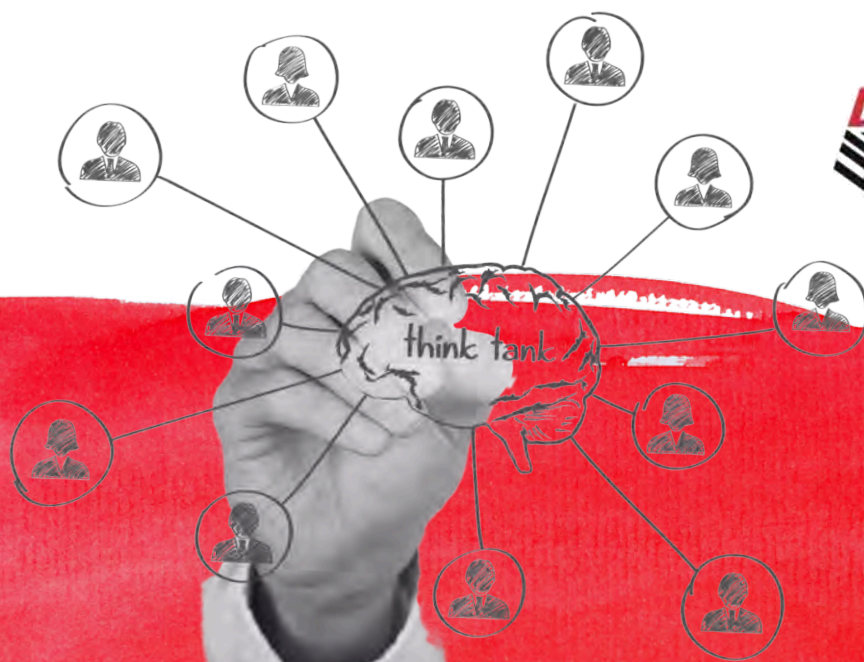**McKinney-Vento Teen Engagement Project**
Aymee Thompson, Education

Point-In-Time Count 2025
Cameron Morgan, Family Studies

Session Moderator: Dr. Janeal White

CENTER FOR RESILIENCY
LAMAR UNIVERSITY

think tank

O.U.R. EXPO 2025
WEDNESDAY, APRIL 23, 2025
SETZER CENTER, NECHES 120
2:30 – 3:30 PM

LAMAR
U N I V E R S I T Y

ANNUAL EXPO
OF RESEARCH AND CREATIVE ACTIVITIES

WORKSHOP SESSION

MACHINE LEARNING AND APPLICATIONS

1 Stock Price Prediction Using Machine Learning Regression Models

2 Predicting Customer Churn with Machine Learning: Enhancing CRM Strategies through Advanced Algorithms

3 A Robust Phishing Attack Detection System Using Random Forest; XGBoost and KNN

4 Advanced Machine Learning Techniques to train models to detect Network Intrusion Detection.

5 HEALTHML: Disease Prediction using Decision Trees and Random Forest

6 BrainTumorML: Evaluating, Analyzing, and Recommending ML Models for Early Brain Tumor Detection in MRI Imaging

7 The Identification of Numerical and Alphabetical Characters through Machine Learning.

8 CREDITRISKML: Credit Risk Prediction using Logistic Regression and XGBoost

DATE:
4/23-4/24
WED & THURS

TIME (BOTH DAYS):
2:30PM-4PM
+
8PM-9PM
(WORKING STUDENTS)

Lamar
University
SOCIOLOGY
RESEARCH

Join Virtually Zoom 884 6388 4792 Passcode 223149

https://us02web.zoom.us/j/88463884792?
pwd=Swqu4vBTKw4bgh5hFHAR5febuau15l.1

LAMAR UNIVERSITY

2025 Spring EXPO
APRIL 24th
2:30- 4:00pm
All disciples welcomed

INSIGHTS AND IMPACTS:
INTERPROFESSIONAL COLLABORATION AND EDUCATION IN REHABILITATION PROFESSIONS

Faculty- Student Panel of Rehabilativie Science Related Discplinces

Join students and faculty for a mixed panel discussion as we discuss the future of rehabilitation, healthcare, and professional education.

Hear from various rehabilitative departments including speech and hearing sciences, nursing, kinesiology and exercise with a audience Q &A.

MIND: Mental health Intervention, Networking, & Diversion

O.U.R. EXPO 2025

Thursday, April 24, 2025
Setzer Center - Neches 120
From 2:30 to 4:00 P.M.

★ STUDENT PARTICIPANTS ★

SOCIAL WORK

Gaberielle Larocca: Mental Health & Crisis Intervention

Aliyah Rivers: Mental Health & Crisis Intervention

COMMUNICATION & MEDIA

Myra Khawaja: Mental Health & Diversion Education/Awareness

Karen Figueroa: Mental Health & Diversion Education/Awareness

CRIMINAL JUSTICE

Cassandra Stanley: Mental Health & Court/Jail Diversion

PSYCHOLOGY

Kenidy Bennett: Mental Health & Crisis Intervention

TEACHER EDUCATION

Maryah Javed: Mental Health & Education

Project PIs:

Ginger Gummelt, PhD, LCSW-S, Associate Professor & Director of Social Work
Stephan Malick, M.Ed. Instructor of Communication, Advisor for University Press
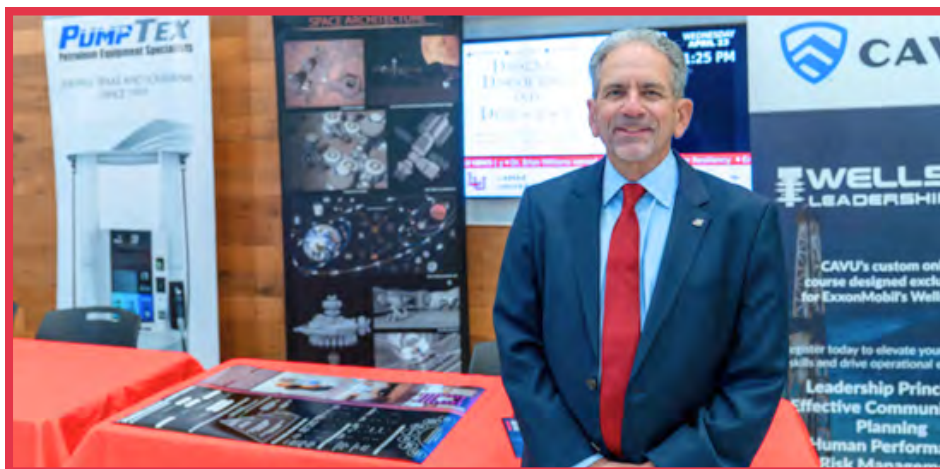**Karen Roebuck, M.A.,** Instructor of Criminal Justice
Lori Wright, MSW, LCSW-S, Instructor of Social Work & Field Director
Manta Singh, PhD, Associate Professor of Teacher Education

CENTER FOR RESILIENCY
LAMAR UNIVERSITY

Thank you, companies and sponsors!

Thank you, mentors!

Thank you, visitors!

UNIVERSITY OF
HOUSTON

RICE UNIVERSITY

UNIVERSITY OF
TEXAS
ARLINGTON

Galveston
College

THE UNIVERSITY OF TEXAS AT DALLAS
UTD
EST. 1969

Congratulations, SURF winners!

Thank you, chairs and judges!

Well done, all presenters!

Thank you, all, for making EXPO 2025 a special event to be remembered!

LURA Officers 2024-2025

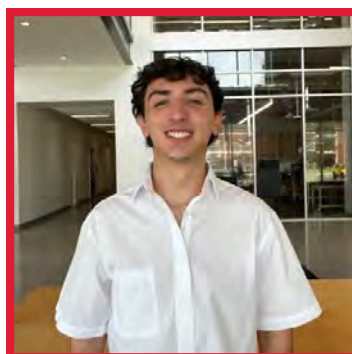**President:**
Sergio Mendez,
Biology Major

Vice President:
Adeline Tran,
Chemistry Major

Treasurer:
Liam Gore,
Biology Major

Secretary:
Rohini Rai,
Computer
Science Major

**Communications
Director:
Garrett Bartlett,**
Finance Major

**Recruitment
Director:
Ybinh Clarabelle
Tran,** Chemical
Engineering Major

**Event
Coordinator:
Kayla McKinley,**
Exercise
Science Major

OFFICE OF UNDERGRADUATE RESEARCH
LAMAR UNIVERSITY

Lamar Undergraduate Research Association

Join our Student Organization!

LURA was founded in Fall 2019 to fulfill the need for a community *by* and *for* undergraduate students to discuss, collaborate, and learn how effectively one can conduct research. The consistent quality and volume of research conducted by undergraduate students at Lamar University has made it clear that there is a need for an organization to act as a vital resource for building young researchers. Thus, LURA provides an academic forum that connects all level students from freshmen to seniors with their professors and mentors and facilitates communication between LU undergraduates and their peers around the nation.

LURA is a platform for offering panel discussions about:

- Research opportunities inside and outside of Lamar
- Better ways to deliver undergraduate research results in poster and oral presentations
- Ways to perform peer-mentoring
- Organizing workshops and panel discussions on various topics, including how to successfully apply to graduate schools

The Office of Undergraduate Research provides strong support and offers logistics for this student organization. For more information, contact URALamar@gmail.com or visit the Office of Undergraduate Research – Archer Physics 100-D.

Dr. Cristian Bahrim – Director of O.U.R.
Office: Archer 100-D, Phone: 409-880-8292
E-Mail: cristian.bahrim@lamar.edu

EJ McMillen – O.U.R. Administrative Assistant
E-Mail: emcmillen@lamar.edu

Lamar Undergraduate Research Association