GSW

GEORGIA SOUTHWESTERN
STATE UNIVERSITY

Undergraduate
Research Symposium

Program

April 18, 2025

SYMPOSIUM SCHEDULE

Time	Event	Location
8:30-8:45 AM	Orientation for speakers, moderators, and judges. Refreshments	SSC Conference Rooms Hall
8:45-11:00	Oral Presentations	SSC 2410, 2413, 2417
11:15-12:15	Poster Presentations	Canes Central
12:15-1:30	Lunch	Cafeteria/ Dining room
1:30-2:00	Awards Ceremony	Private Dining room

The organizing committee would like to recognize the following individuals and organizations for their support:

Sigma Mu Pi Nursing Honor Society | The GSW Foundation

Cheri Paradise | Jonathan Hobbs

Volunteer Judges

Surya Amarachintha	Tzvetelin Iordanov	Yangil Park
Yongwon Cho	Anne Jacobs	Jennifer Ryer
Paul Dahlgren	John LeJeune	K. Scanlon-Richardson
Kina Davis	Brian Mallett	Zhanxin Sha
Bonnie Gary	Brittany Mellinger	Michele Smith
Debaleena Ghosh	Rebecca Miller	Jason Wicker
Stephanie Harvey	Annie Laurie Nichols	

Moderators

Amari Rudison	Chris Pickett	Alexander Morton
Kennedy Daniels	Amelia Howard	Harleigh James

Many thanks to everyone who has helped make this event a success!

Time	Talks in SSC 2410
8:45 AM	A Mathematical Model of Purposeful Exercise: Enhancing Weight Loss, Health, and Well-Being Presenter: Grace Layman 1
9:00 AM	Blue Water Navy Veterans Who Were Exposed to Agent Orange vs. The Veterans Affairs Presenter: Megan Ogden 2
9:15 AM	Affirmation Vietnam Presenter: Nicole Givens 3
9:30 AM	Use of Copula Functions in Investment Portfolios Presenters: Alison Stubbs, Noah Gibbs, Kaylee Gotthardt4
	15-Minute Intermission
10:00 AM	Real or Reel? Exploring the American Experience in Vietnam as Hollywood or History Presenter: Connor Mathis 5
10:15 AM	Optimizing Nutrient Film Technique Hydroponics: The Role of 3D Printing and Color Design in Enhancing Plant Growth and Reducing Algae Presenter: Aleyah Niette 6
10:30 AM	Serving God in a War Zone: US Military Chaplains and the Vietnam War Presenter: Trenton Mays 7
10:45 AM	N/A
11:00 AM	Break Before Poster Session

Time	Talks in SSC 2413
8:45 AM	Study-Buddy: AI-Powered Learning Companion for GSW Students Presenters: Dhrumilkumar Patel, Blaine Jackson, Samuel Astronomo 1
9:00 AM	CRISPR-mediated activation of BAAT gene to study liver failure in biliary atresia Presenters: Jamesha Hollomon, Arul Thason 2
9:15 AM	GTJ GO! (Travel Safety Companion) Presenters: Gabi Green, Tyeshia Walker, Jasmine Sparks 3
9:30 AM	Understanding TCP: Evaluating the Different Versions Presenter: Jada Thomas 4
	15-Minute Intermission
10:00 AM	Securing Multi-Domain Attacks: A Game Theoretic Approach Presenter: Nahkiyahs Felder 5
10:15 AM	Verdure AI Plant Care Assistant Presenters: MaShayla Kendrick, Sahil Patel, Feifei Xie 6
10:30 AM	Low Voter Turnout in the United States: An Examination of Selective Causes Presenter: Frederick Wright 7
10:45 AM	N/A
11:00 AM	Break Before Poster Session

Time	Talks in SSC 2417
8:45 AM	Lam Son 719: A Vietnamization Test Case Presenter: Collin Phillips 1
9:00 AM	Political Polarization in the United States: How Presidents Ronald Reagan and Donald Trump Polarized the Present Presenter: Connor Mathis 2
9:15 AM	The Inhibitory Effect of Salt, Sugar, and Vinegar on Escherichia coli Presenters: Nicholas Wood, Claudine Mae Rodriguez, Conner James 3
9:30 AM	The Vietnam War Presenter: Cat Coules 4
15-Minute Intermission	
10:00 AM	Feasibility Of Implementing AI Features Effectively Into Video Games Built In Unity Presenters: Alexander DeYoung, Clayton Ware, David Harrison 5
10:15 AM	Life of Draft Evaders During the Vietnam War Presenter: William Masters 6
10:30 AM	CampusConnect: Enhancing Campus Navigation and Resource Access with AI-Powered Assistance Presenters: Anjali Patel, Shaylan Daniel, Sophia Aparicio-Malacara 7
10:45 AM	The President Decides: Jimmy Carter, Decision Making, and the Hostage Crisis in Iran Presenter: Chloe Ard 8
11:00 AM	Break Before Poster Session

Oral Presentation Abstracts

Title: Optimizing Nutrient Film Technique Hydroponics: The Role of 3D Printing and Color Design in Enhancing Plant Growth and Reducing Algae
Presenter: Aleyah Niette
Faculty Mentor: Lee Wright and Stephanie Harvey
Abstract: Hydroponics have gained attention for the potential to enhance agricultural productivity, but challenges such as algae growth within a system can be problematic. This study investigated how de novo design elements created via 3D printing for use in a Nutrient Film Technique (NFT) system could reduce these issues while promoting healthy plant growth. The created elements focused on reducing algae growth and easing sanitation between crops. Additionally, the impact of 3 different colors of the 3D-printed covers on plant growth was analyzed. Results suggest that the design successfully minimized algae growth and supported robust plant development. Early trials indicated that the silver-colored covers influenced higher growth rates, suggesting a link between design features and plant health. These findings highlight the potential of 3D printing in hydroponics, which offers an innovative approach to sustainable agriculture. Future research will optimize the 3D printing process and further investigate color effects to enhance plant growth and system efficiency

Title: Use of Copula Functions in Investment Portfolios
Presenter: Alison Stubbs, Noah Gibbs, Kaylee Gotthardt
Faculty Mentor: Kailash Ghimire
Abstract: When making decisions on investments with uncertainty, one needs to consider many factors known as risk factors and make diversified investments. The growth of the investment is affected by many risk factors. One way to examine the relationship between them is by looking at the correlation among them, which tells us the strength of the linear dependency, if there is any correlation. In this presentation, an alternative method – the copula function – will be discussed to identify the non-linear dependencies between the factors and between the investments, with the goal of maximizing returns with minimal risks.

Title: CampusConnect: Enhancing Campus Navigation and Resource Access with AI-Powered Assistance
Presenter: Anjali Patel, Shaylan Daniel, Sophia Aparicio-Malacara
Faculty Mentor: Jonathan Hobbs

Abstract: University students, parents, and faculty often face difficulties navigating campus resources and staying informed about events, impacting connections and academic success. How feasible is to have AI-Driven Navigation/Recommendation to improve user experience with campus connectivity and engagement? CampusConnect addresses this difficulty by integrating AI-powered recommendations, a real-time campus assistant, personalized suggestions, university resource navigation, and instant answers through a user-friendly chatbot interface. The platform of Firebase utilizes real-time data retrieving, Google Maps API for accessibility and navigation features, and the Firebase built-in extension for user interactions with the AI chatbot.

By delivering responses, the chatbot enhances the user experience and minimizes user flow to navigate multiple platforms for information. This research explores the feasibility and impact of AI-powered personalization in higher education, analyzing key trade-offs between recommendation accuracy and system response times, including quick AI generated responses. Furthermore, the cost and performance of all platforms when deployed at scale are evaluated with great efficiency and cost-management. A crucial aspect of this study is balancing personalization with accessibility, ensuring AI-generated recommendations are equitable and beneficial for all users with diverse needs.

The findings offer valuable insights into the effectiveness of AI-driven campus solutions, showcasing their potential to transform higher education environments.

Title: Study-Buddy: AI-Powered Learning Companion for GSW Students
Presenter: Dhrumilkumar Patel, Blaine Jackson, Samuel Astronomo
Faculty Mentor: Jonathan Hobbs
Abstract: Study-Buddy is a friendly AI voice assistant aimed at providing personalized learning experiences for Georgia Southwestern State University students. Our research investigates and implements how AI technologies can be used to develop interactive learning companions that engage with students. We aim to investigate real-world questions such as: What are the performance implications of generating quizzes through OpenAI versus using pre-stored content? To what extent can Azure and MongoDB handle data within live collaborative lessons? Lastly, what is the cost of leveraging cloud-based AI infrastructure for educational purposes? Usability and reliability are the top priorities for the Study-Buddy platform, which utilizes technologies such as GitHub Copilot and Microsoft Azure AI services. The framework is also security focused, utilizing APIs that

prioritize data protection being a key aspect.

Study-Buddy has immense potential to enhance digital learning at GSW. Future research will focus on increasing personalization, improving performance for real-time interaction, and minimizing costs to make the platform even more efficient and viable for large scale implementation.

Title: The Vietnam War
Presenter: Cat Coules
Faculty Mentor: Glenn Robins
Abstract: The Buddhist concepts of the importance of fire and of human suffering are most key to understand the utilization of self-immolation as a political protest.

Thich Quang Duc was the first of at least six Buddhist monks in Vietnam to self-immolate as a form of political, and religious, protest against the American-backed Diem regime and their persecution of Buddhists. His death set off a chain of events that would lead three activists to follow suit upon American soil, and deeply impacted Vietnam War protest culture across the globe, while directly leading to the end of the Catholic Diemist rule of South Vietnam. This paper seeks to define the conditions of political suffering that inspired the act of self-immolation and where they intersect with the religious tenets of Buddhism. The research includes the letters of Thich Quang Duc at the time of his self-immolation, the commentary of journalist Malcolm Browne and Thich Giac Duc, the official religious policy of the Diem government, and Buddhist religious materials.

Title: Lam Son 719: A Vietnamization Test Case
Presenter: Collin Phillips
Faculty Mentor: Glenn Robins
Abstract: In 1969, President Richard Nixon implemented a new military strategy in Vietnam known as Vietnamization which shifted the responsibility of fighting the Communists from the Americans to the South Vietnamese. This project examines the Battle of Lam Son 719 to assess the strengths and weaknesses of Nixon's strategy. The Battle of Lam Son 719 was a failed South Vietnamese invasion of Laos in 1971, supported by U.S. forces, aimed at disrupting the Ho Chi Minh Trail but ultimately resulting in heavy casualties and a chaotic retreat.

This project will test the argument of historian and veteran James Willbanks who argues that Vietnamization was implemented too late. General Major Nguyen Duy Hinh stated about Lam Son 719 in a government document, "In contrast to the enemy who had large uncommitted reserves in North

Vietnam, our reserves were limited in indeed. The Airborne and Marine Divisions constituted the entire general reserves of the RVN and they were already committed."

This study helps answer questions about how heavily the South Vietnamese relied on American military support and whether Vietnamization was doomed to fail.

Title: The President Decides: Jimmy Carter, Decision Making, and the Hostage Crisis in Iran
Presenter: Chloe Ard
Faculty Mentor: David Berggren
Abstract: President Jimmy Carter faced several challenges while in office. One of those notable challenges involved the 1979 Iranian Revolution and the ensuing Iranian Hostage Crisis. The crisis involved the storming of the U.S. embassy and the taking of U.S. hostages. They were held for 444 days. It has been said that this was one of the major factors that led to his defeat for reelection in 1980. Throughout the crisis, Carter faced many choices on how to handle the different situations that occurred. There were his initial decisions during the crisis and many more he confronted as time went on. But what kind of decision maker was Carter? To answer this key question, this paper will cover Carter's initial decisions involving the crisis and explore why he made them. There are three specific decision points that I will cover. They include Carter's decision to allow the exiled Shah of Iran into the United States in October of 1979, his decision to be patient and use diplomacy during the early days of the crisis, and his initial decisions on military force.

Title: Feasibility Of Implementing AI Features Effectively Into Video Games Built In Unity
Presenter: Alexander DeYoung, Clayton Ware, David Harrison
Faculty Mentor: Jonathan Hobbs
Abstract: Artificial intelligence has become a staple in many industries as a way to adapt to difficult work endeavors. Unity as a game development platform has a multitude of built-in tools which streamline the development process which include tools for AI development and integration. This research project explores how feasible it is to incorporate Unity's AI tools into the game settings without experiencing loss of performance and unneeded expenses in processing power. There are different forms of AI that all have different pros and cons, but generally they revolve around the computing power required to respond to the

player's actions, the cost of processing power, complexity, speed of the response and potential unpredictability of AI systems. By analyzing AI performance in different scenarios, we looked to assess use of hardcoded methods, instead of machine learning methods and found that they may lead not only to smoother gameplay, but an easier development cycle. Our findings aim to provide insight to other game developers that hard coding AI is vastly more efficient when it comes to being more cost efficient with computational power, being easier to implement in a live environment, and being more dynamic for development.

Title: The Inhibitory Effect of Salt, Sugar, and Vinegar on Escherichia coli
Presenter: Nicholas Wood, Claudine Mae Rodriguez, Conner James
Faculty Mentor: Anh-Hue Tu

Abstract: Preservatives play a critical role in extending food shelf life, and while synthetic preservatives are extensively used in modern food processing practices, many consumers are concerned that some preservatives are not safe for consumer consumption. Salt, sugar, and vinegar are natural preservatives that have been used for their antimicrobial qualities for centuries. In this study, the effectiveness of salt, sugar, and vinegar as preservatives was tested against Escherichia coli. Increasing concentration of each preservative was added to a nutrient broth culture containing E. coli to measure the minimal inhibitory concentration. For salt, concentrations of 0 %, 2.5%, 5%, 7.5%, and 10% were tested. For sugar, similar percentages were used with an addition of 20%. For vinegar, concentrations of 0%, 0.5%, 1%, 1.5%, and 2% were used. The result indicated that vinegar at 1% concentration completely inhibited bacterial growth. Salt, at 10% concentration completely inhibited bacterial growth. Sugar was not completely inhibitory at 20% even though some inhibitions were observed. The differential effects may be due to the mechanisms of action. The low pH of vinegar is very effective in denaturing bacterial proteins and inhibiting cellular activities. Increasing concentrations of salt is inhibitory due to the hypertonic environment generated by the salt that causes cell shriveling. Sugar, however, is not completely inhibitor since carbohydrates can be used as an energy source. Higher levels show some inhibitory effect possibly due to the hypertonic environment outside the cell. Low levels allow sugar to serve as an energy source for promoting bacterial growth instead of inhibition. Future studies include increasing sugar concentration from the current 20% up to 50%. The need to use such high concentrations of sugar to completely inhibit bacterial growth may outweigh the benefits of using it as a natural

preservative, due to the health risks associated with excessive sugar consumption.

Title: Political Polarization in the United States: How Presidents Ronald Reagan and Donald Trump Polarized the Present
Presenter: Connor Mathis
Faculty Mentor: David Berggren
Abstract: Over the last few years, modern political polarization within the United States seems to have hit an all time high. When looking at polling data since the 1940s, modern presidential approval numbers vary dramatically between parties at a record high.With shocking consistency, Republicans oppose Democratic presidents and Democrats oppose Republican presidents. There are even claims on both sides that if the other party gains power, they fear serious harm will be done to the future of American democracy. It has not always been like this, so what has changed? Why have we gotten to this point? What specific factors caused this massive divide to appear? Over the course of my project, I will take a dive into the Republican party, and conduct a case study on the presidencies of Ronald Reagan and Donald Trump. Specifically, I will examine how their presidential communication contributed to the political polarization that plagues our country today.

Title: Real or Reel? Exploring the American Experience in Vietnam as Hollywood or History
Presenter: Connor Mathis
Faculty Mentor: Glen Robins
Abstract: "Vietnam was framed by two scenes, the television box and big-screen cinema…" A quote from the book *New Perspectives on the Vietnam War* not only sits true about the past, but clearly the present as well. In modern day, films about the Vietnam War frame a majority of people's mindsets when it comes to what actually happened during the war, whether correct or incorrect. This led me to take a closer look into each of the major films about the Vietnam War. After consideration, I chose *Good Morning Vietnam* to ask a simple, yet important question: How do specific scenes in the film *Good Morning Vietnam* attempt to portray the American experience in Vietnam? Comparing those scenes to the real life accounts of Adrian Coneaur (the man who the film is based on), it shows how even if a film is not perfectly accurate, its messages can teach us many important lessons about both the past and present, while also delivering a powerful message about finding humanity within war.

Title: Low Voter Turnout in the United States: An Examination of Selective Causes
Presenter: Frederick Wright
Faculty Mentor: David Berggren
Abstract: Voter participation is a fundamental component of a thriving democracy, so why does the United States consistently experiences low voter turnout compared to other developed, democratic nation? This paper examines selective causes of comparatively low voter participation, with a particular focus on voter disengagement and restrictive voting laws. Policies such as stringent voter ID requirements, reductions in early voting, and complex registration processes—particularly in states like Texas, Georgia, and Florida—have disproportionately impacted marginalized communities, including racial minorities, low-income individuals, and students. These laws not only create barriers to the ballot box but also contribute to long-term voter suppression by fostering frustration and confusion within the electorate. By analyzing the effects of these restrictions, this paper underscores the broader implications of voting policies on democratic participation in the United States.

Title: A Mathematical Model of Purposeful Exercise: Enhancing Weight Loss, Health, and Well-Being
Presenter: Grace Layman
Faculty Mentor: Manoj Thapa
Abstract: In the United States, there has been an ongoing concern with obesity and declining public health. A potential solution to this problem is "purposeful exercise." Purposeful exercises are intrinsically motivating activities integrated into everyday life, such as gardening, raising animals, dancing, or engaging in other enjoyable physical activities. This study investigates the effects of purposeful exercise on weight loss, happiness, and health through a mathematical model that uses a system of differential equations to simulate the interactions between energy expenditure, caloric intake, stress, and motivation. The results point toward purposeful exercise being more sustainable for weight loss, improved mental health, and greater overall well-being compared to traditional exercises. This approach may lead to better adherence rates and long-term outcomes for weight loss and overall welfare.

Title: Understanding TCP: Evaluating the Different Versions
Presenter: Jada Thomas
Faculty Mentor: Satyaki Nan

Abstract: Transmission Control Protocol (TCP) is a fundamental component of modern internet communication, ensuring reliable and orderly data transmission. Unlike the User Datagram Protocol (UDP), which prioritizes speed over reliability, TCP guarantees the correct sequencing and delivery of data segments. Over time, TCP has evolved to incorporate various mechanisms, including Reliable Data Transfer (RDT), Go-Back-N, and Selective Repeat, each enhancing performance and efficiency. Additionally, congestion control techniques, such as slow start, prevent network overload and improve stability. This paper explores the different versions of TCP, comparing their functionalities and improvements over time. By analyzing the advantages of TCP over UDP, despite UDP's lower latency, this study highlights why TCP remains the preferred protocol for most internet applications.

Title: CRISPR-mediated activation of *BAAT* gene to study liver failure in biliary atresia
Presenter: Jamesha Hollomon, Arul Thason
Faculty Mentor: Surya Amarachintha

Abstract: Biliary atresia (BA) is characterized by loss of extrahepatic bile duct and responsible for nearly half of pediatric liver transplantations. Despite surgical intervention, the disease continues to progress resulting in liver failure. Previously, we analyzed publicly available gene datasets from normal (N=7) and BA livers (N=171), and identified a 2-fold increase of bile acid-CoA:amino acid N-acyltransferase (*BAAT)* in BA livers, an enzyme that produces conjugated bile acids. To test this, we aimed to activate *BAAT* gene in human liver cells using CRISPR – Cas9 system and investigate if excess bile acids produced cause liver failure. Clustered regularly interspaced short palindromic repeats (CRISPR) along with CRISPR associated protein 9 (Cas9) is a naturally occurring bacterial genome editing system that we adapted in mammalian cells. First, we expanded envelope plasmid (pMD2.G), packaging plasmids (pMDLg/pRRE and pRSV-Rev), and transfer plasmid (dCAS9-VP64_GFP) using bacteria. Second, we generated Cas9 lentivirus by transfecting these plasmids into A293T cells. Third, we transduced the lentivirus into HepG2 human liver cells for a stable Cas9 nuclease expression. Finally, we introduced *BAAT*-specific RNA (crRNA:tracrRNA) sequence for guiding Cas9 protein to a genomic location that consistently activated *BAAT*. Currently, we are testing whether

increased BAAT enzyme elevates conjugated bile acids and causes liver cell damage.

Title: Securing Multi-Domain Attacks: A Game Theoretic Approach
Presenter: Nahkiyahs Felder
Faculty Mentor: Satyaki Nan
Abstract: Modern systems integrate physical and cyber components in cyber-physical systems. The research presents a novel security framework where multiple domains can be present, and each domain can have multiple users or resources. We investigate the necessity for multiple domains, such as cyber and physical domains to enhance the overall believability and effectiveness of defensive strategies. The research also investigates the cost-benefit analysis of the security infrastructure using game theory while considering the actions of other users and their different potential losses from security breaches. Our model considers the potential collateral damage from an indirect attack and cross-side channel attack. Our research finds that an increase in the probability that the security infrastructure is compromised, given a successful attack on a user, may force the low-profile users, such as cyber domain participants, to protect and thus increase the overall security to yield better outcomes to high-profile users such as the physical domain participants. The research investigates the relation between the total cost required to invest in security. The research also presents numerous results to gain important insights into our analytically characterized strategies

Title: Blue Water Navy Veterans Who Were Exposed to Agent Orange vs. The Veterans Affairs
Presenter: Megan Ogden
Faculty Mentor: Glenn Robins
Abstract: There are between 420,000 and 560,00 veterans that the government considers to be Blue Water Navy veterans who were men that served in the Navy during the Vietnam War. They were stationed on ships off the shore of Vietnam though they never stepped foot onto the country itself. However, many of these men have not received any benefits from Veterans Affairs as the VA deemed the contact from Agent Orange did not occur as they were too far out from land where it was hit. Upon my research from primary and secondary sources, I have found that many of these men who were affected by the toxin have received little to no benefits from the VA as the evidence they provided was not enough. Even though they provided them with information about when, where, and what ship they

were on, the VA does not link their illnesses to Agent Orange.

This paper will document the health struggles these men faced, the difficulty in obtaining VA benefits, and the importance of the Blue Water Navy Vietnam Veterans Act of 2019. This is important because these Veterans who fought in a war that many of them did not want to be in are being let down by their government once again.

Title: Affirmation Vietnam
Presenter: Nicole Givens
Faculty Mentor: Glenn Robins

Abstract: Affirmation Vietnam was a student organization in favor of the Vietnam War and was established in December 1965, by a group of Emory University students. In February 1966, the organization organized a protest in support of the war at Atlanta-Fulton County Stadium, Atlanta, Ga. The heart of my research will be analyzing what Affirmation Vietnam was, including a brief look into the context behind it. This research is important to understand the controversy and different perspectives surrounding the Vietnam War.

Sandra Scanlon, author of *The Pro-War Movement: Domestic Support for the Vietnam War and the Making Modern American Conservatism,* wrote this book to highlight the Americans who supported the war. Her book emphasized how the pro-war protestors believed that the war was a just and necessary one. My research will support Scanlon's writing.

Following Scanlon's research, I will be analyzing how different universities reacted to Affirmation Vietnam. The University of Georgia will be studied first, using the *Red and Black* as my sources base. The reaction of Georgia Southwestern State University to Affirmation Vietnam will be next and I will be using the Southwester newspaper as my sources base. This research will determine the motivation behind the pro-war movement on these two Georgia campuses.

Title: Verdure AI Plant Care Assistant
Presenter: MaShayla Kendrick, Sahil Patel, Feifei Xie
Faculty Mentor: Jonathan Hobbs

Abstract: Scalability and efficiency are crucial in developing an AI-powered plant care application. This research examines the viability of Firebase, Gemini, and Google Vision in building an efficient and intelligent plant care system capable of plant identification, care recommendations, and disease detection.

Firebase serves are our backend database in managing our user

information, data retrieval, and ensures scalability. Google Vision enables image-based plant identification and disease detection; Google Gemini enhances user engagement while gathering information from Perenual API and providing specific information about plants.

This study evaluates these technologies based on, how effectively can an AI plant care system utilize these tools to deliver accurate and efficient plant care recommendations and, what are the key benefits and limitations of using these technologies for real-time plant care solutions.

Title: Serving God in a War Zone: US Military Chaplains and the Vietnam War
Presenter: Trenton Mays
Faculty Mentor: Glenn Robins
Abstract: Working question: how did US military chaplains minister to men in a war zone?

Many Chaplains during the Vietnam War faced many troubles and tribulations. Chaplains served God and ministered to men in a war zone that was a nightmare to many. Many prayed with soldiers, witnessed to them, baptized them, and helped them through many difficult situations. William P. Webb shares experiences throughout his letter like how he he tells us he "did all kinds of counseling in Viet Nam." (10) with men that struggled through issues on the battlefield and back home in America. He also writes about how he would host public services and help soldiers through rituals and even baptized men. Through this paper, I hope to answer the question "how did US military chaplains minister to men in a war zone?" focusing on their action, hearts, and thoughts through it all. The purpose of this paper is to show the impact and purpose of US Chaplains in the Vietnam War.

Title: GTJ GO! (Travel Safety Companion)
Presenter: Gabi Green, Tyeshia Walker, Jasmine Sparks
Faculty Mentor: Jonathan Hobbs
Abstract: A major concern when traveling in today's world is safety. To ease the minds of travelers, a travel safety companion that gives real-time safety scores for any country, city, or location along with real-time transportation options and routes, currency exchange, and live translations provides great peace of mind. Which prompts the question; Is it feasible to pull data from various APIs to create a real-time scoring system that is balanced and all-encompassing to what is important to travel safety? In this project, data such as femicide, domestic violence, night walking, crime, in-app user

reviews, and ratings are all considered and weighed evenly in the score. APIs such as Google Maps for accurate location searching and Google translate API for live translations are all implemented to give real-time data. The effectiveness of the project will be determined by the accuracy of the safety scores in comparison to real life data on women's safety and crime rates of a location. By addressing feasibility, this project demonstrates the affordability, technical, and practical viability of a travel safety companion. The results from this project will have the potential for real-time safety information, data, and tips to keep travelers safe at any location.

Title: Life of Draft Evaders During the Vietnam War
Presenter: William Masters
Faculty Mentor: Glenn Robins

Abstract: This Symposium hopes to answer what life was like for the 570,000 men who evaded the Vietnam War Draft. Whether these men disagreed with the premise of the conflict itself, worried for their safety, or were horrified by the news stories coming out of the Vietnam warzone, they all would make their attempt to avoid the draft.

This was done by claiming to be mentally unfit for service, applying for waivers for work/education/family reasons, going underground in the US, or fleeing the country to Canada. Which welcomed them as potential "good Canadians"; however, their population was angry about the number of those fleeing into the country due to the ongoing unemployment crisis. The US Government was utterly against the draft evaders; President Nixon is quoted as saying, "We stand for a strong America versus a weak America. We stand for no amnesty for draft dodgers and deserters."

This paper expects that life for those attempting to evade the draft was a life of self-imposed exile and social ostracism from all those surrounding them. There was no support for evaders as they fled, which is just another consequence of being anti-War during this time.

Poster Abstracts

Posters will be available for early viewing by the morning of April 17th.

Title: Enhancing Mosquito Oviposition Through Optimized Trap Humidity: A Study on Improved Collection Methods
Presenter: Aleyah Niette
Faculty Mentor: Ian Brown
Abstract: Mosquito-borne diseases represent a public health concern globally, and therefore mosquito populations must be monitored continually. Mosquito surveillance is conducted using different types of traps to capture the different lifecycle stages. This study investigates the question, Does the optimization of trap humidity levels increase mosquito oviposition and thereby enhance egg collection. Traditional oviposition trapping methods often suffer from limitations, such as rapid water evaporation and debris accumulation. To investigate this, traps constructed from plastic coffee containers were modified to regulate drainage, and a 3-D printed roof was added to optimize moisture retention and prevent debris from entering the trap. The trap designs were field tested in the GSW Bowen property forest. Trap design efficacy was assessed by egg counts, 7 days after trap deployment. It is expected that the trap design which maintains high humidity levels for the longest time will attract more gravid females therefore show the greater oviposition rates. Future research will focus on creating species specific trap designs to facilitate vector control studies.

Title: Behind The Smile: Exploring Student Joy
Presenter: Madelyn Dunston, Makayla Lucas, Jade Lewis, Ty Thomas
Faculty Mentor: Sally Merritt
Abstract: This research study focuses on the effectiveness of activities aimed at helping people become happier. The study was conducted with several classes of psychology students adding up to approximately 75 students. They were asked to rate their happiness level on a scale from 1-10, then they were asked to complete one of the 10 activities listed on a powerpoint, including spending 30 minutes to write down what they are grateful for, spending 10 minutes thinking about a difficulty in their life and imagine how someone would help them get through it, spend 10 minutes writing about their future goals and who they want to be, etc. Then they were asked to write a little about the activity and finally asked to rate their

happiness again. We will perform T-tests on the data we have to determine if there are any significant changes in happiness levels before and after they completed the activities. We will also conduct exploratory analysis that will help us to see if certain activities worked better than others. This study is important because these mindfulness activities could help students keep their spirits up and help them do better in school.

Title: Temperature Stress Effects on Heat Shock Protein Expression and Mitochondrial Membrane Potential
Presenter: Jamesha Hollomon
Faculty Mentor: Ian Brown
Abstract: Do temperature extremes result in Heat shock protein production and mitochondrial damage in HEPG2 liver cells? Heat shock protein 70 (HSP70) expression and mitochondrial membrane damage was quantified using immunofluorescence microscopy, TMRE dye, and ImageJ software. HEPG2 liver cells were exposed to three temperatures (4℃ suboptimal, 37℃ optimal control, and 42℃ supraoptimal) for 30 and 45 minutes and then allowed to recover for 24h at 37℃. Cells exposed for 45 minutes to 42℃ and 4℃ produced the most intense fluorescence from HSP70 expression and the least fluorescence for TMRE due to mitochondrial damage. The fluorescence of actin and exposure to 37℃ controls showed no HSP70 production or mitochondrial damage. To conclude, cells exposed to temperature extremes for prolonged periods of time demonstrated HSP70 protein expression as a defense mechanism. Furthermore, the controls demonstrated that the cellular changes were temperature induced and not due to other factors such as actin cytoskeletal damage or other unknown variables. These results support the hypothesis that environmental factors such as temperature extremes do result in the activation of Heat shock protein defense mechanisms to protect the cell.

Title: The Effects of Targeted Retention Programs and Burnout in Nursing
Presenter: Jazaria Haywood, Jacob Rose, Spencer Rose, Deshawn Toliver
Faculty Mentor: Bonnie Gary
Abstract: This evidence-based research project explores the effectiveness of targeted nurse retention programs in reducing burnout and turnover within healthcare settings. The PICOT question guiding this study focuses on the impact of implementing specialized retention programs compared to standard practices in addressing nurse shortages and turnover rates over a specific time. By synthesizing current research, the brief examines key

strategies such as mentorship, resilience training, and organizational support aimed at enhancing job satisfaction, emotional well-being, and resilience among nurses. The goal is to identify interventions that effectively improve retention, reduce burnout, and foster a sustainable healthcare workforce. The findings underscore the importance of targeted support systems and workplace interventions in improving nurse job satisfaction and retention, offering valuable insights for healthcare administrators seeking to mitigate turnover and ensure long-term workforce stability.

Title: An Analysis of Reflections on HAIL (High-Impact Approach to Integrated Learning)
Presenter: Kayla Crisp, Kaleb Hudson, Leslie Wakefield
Faculty Mentor: Sally Merritt
Abstract: The goal of this research is to better understand students' experiences in HAIL (High-Impact Approach to Integrated Learning). The HAIL initiative is part of GSW's Quality Enhancement Plan, which aims to engage students and connect long-term goals with the course structure. Student participants were assigned to write an essay in which they were to reflect on their experience in the HAIL course. Three independent research coders reviewed and marked the essays for reoccurring themes such as connection to other courses, improved relationships, greater sense of purpose, and strengthened career goals. Further analysis of these themes will reveal how frequently they occurred among these essays. This study offers insight into the HAIL initiative through a more structured scientific analysis.

Title: Sepsis
Presenter: Kaylee Hodges, Neely Austin, Paige Adams, Rebekah Cooper
Faculty Mentor: Bonnie Gary
Abstract: Sepsis is a life-threatening infection in the bloodstream caused by widespread inflammation and tissue damage. Sepsis has a high mortality rate and must be controlled in a timely manner. The PICOT question reads in providing care for hospitalized patients, which sepsis protocol has the greatest outcomes when caring for patients with sepsis. The aim of this research is to evaluate which sepsis protocol has the greatest outcome when caring for hospitalized patients with sepsis. There are many different approaches on how to treat and cure sepsis. One is using a multidisciplinary team approach to establish clear guidelines for early interventions, including administering broad-spectrum antibiotics, administering fluids,

and ongoing monitoring of the patients' status and vital signs. The research and knowledge that was found proves that having a nurse navigator improves compliance with the sepsis care bundle and decreases patient mortality rates.

Title: How does catheter hygiene compared to dwell time affect the occurrence of a catheter-   associated urinary tract infection within the patient's admission?
Presenter: Elizabeth Aka, Teewon Beglar, Laren Chester, Kirsten Walls
Faculty Mentor: Bonnie Gary

Abstract: Catheter-associated urinary tract infections (CAUTIs) represent a significant challenge in healthcare facilities, contributing to increased patient morbidity, hospital stays, and elevated healthcare costs. This research investigates the comparative impacts of catheter hygiene practices and dwell time on CAUTI prevention. Catheter hygiene encompasses essential protocols such as hand hygiene, sterile insertion techniques, and regular maintenance of catheter sites. In contrast, dwell time refers to the duration a catheter remains in place, with evidence suggesting that longer dwell times correlate with higher infection risks due to biofilm formation and bacterial colonization.

Through a comprehensive review of current literature and analysis of infection rates across various healthcare settings, this study aims to determine which factor—hygiene practices or dwell time—plays a more critical role in CAUTI prevention. Preliminary findings indicate that while both factors are important, strategies aimed at reducing dwell time may yield more significant reductions in CAUTI rates. Ultimately, the findings suggest a combined approach focusing on both hygiene and timely catheter removal to improve patient safety and care quality.

Title: Modeling Fatty Liver Disease in a Dish
Presenter: Maribel Brizendine
Faculty Mentor: Surya Amarachintha

Abstract: Fatty Liver disease in cattle is a severe metabolic disease caused by excessive fat accumulation in liver. Despite efforts, cases continue to rise affecting health of cattle and quality of dairy products thus causing economic losses. In this study, we aim to create a cell-culture model in the lab to study fatty liver disease and test a drug that can reduce fat accumulation. First, we cultured HepG2 cells, hepatocytes derived from human liver and exposed them with free fatty acids Palmitic acid and Oleic acids, either alone or in combination for two days. Cells polymerized fatty

acids with glycerol, made neutral lipids and stored as fat droplets. To visualize and quantify fat accumulated, cells were stained with fluorescent dye BODIPY and images were quantified using Image J. Results indicated that cells exposed with Palmitic and Oleic acids combined (3.38±0.79 fu) showed significantly greater accumulation of fat compared to control (0.19±0.15 fu) and Palmitic (0.15±0.08 fu) or Oleic (2.49±0.86 fu) alone. Next, cells exposed to fatty acids when treated with pioglitazone hydrochloride showed significant reduction in accumulation of fat droplets both in combined (1.34±1.01 fu) and Oleic acid (0.56±0.26 fu) exposures. Finally, our findings suggest that cell-culture model can be developed to study fatty liver disease in cattle and new drugs can be tested for treatment.

Title: Pressure Injuries
Presenter: Malone Aldridge, Zoee Jones, Shelby Law, Mary Henderson Hurdle
Faculty Mentor: Bonnie Gary
Abstract: Pressure injuries are a significant concern in hospitalized patients, especially those who have multiple comorbidities. Pressure injuries come from unrelieved compression of soft tissues on bony prominences in combination with shearing, tearing, friction or moisture. What is best practice for elderly patients and managing pressure ulcers in addition to turning every two hours? During this study we researched evidence-based practice articles that involved using focus groups and quantitative data to investigate what other causes can be involved with delaying the healing of pressure ulcers in elderly patients. The research we gathered supported the idea that patients who are turned every two hours maintain skin integrity on bony prominences such as the sacral area, elbows and back of the feet. The study's main findings prove that turning patients and ensuring areas are kept dry greatly decreases the risk of a patient contracting a pressure injury. Our research discovered there may be a lack of training in staff for the prevention of pressure ulcers. We must examine the effectiveness of continuous care for elderly patients at risk, evaluate the impact of taking several medications, correct anemia and provide a high protein diet.

Title: LEDs of Different Wavelengths: a way to decrease *Chlorella sp.* growth in hydroponic systems
Presenter: Katie Rogers
Faculty Mentor: Ian Brown
Abstract: Different wavelengths of light affect plant and algal

photosynthesis and growth. The goal of this experiment is to determine if different wavelengths of LED lights can decrease *Chlorella sp.* growth for hydroponic systems. Nutrient solution containing algae was acquired and placed in petri dishes. The dishes were placed in a greenhouse and natural light as well as white (full spectrum), far-red (680-730nm), and UV (340-400nm) LEDs were used to grow the algae. Three trials were run occurring for three-, two-, and one-week periods. Following each treatment a spectrophotometer was used at 680nm to determine the optical density and percentage transmittance, and the dry weight was determined for each plate. The most algal growth occurred in plates grown under natural light, and the least algal growth occurred in the plates placed under the UV LEDs. The following results can help future hydroponic systems because the UV light can be placed in water tank to hopefully prevent or slow the growth of algae.

GSW

GEORGIA SOUTHWESTERN
STATE UNIVERSITY

#PARTOFTHEBRAINSTORM