

UC SANTA BARBARA  
Summer Sessions

2024 SUMMER RESEARCH ACADEMIES  
CAPSTONE SEMINAR  
**PROCEEDINGS**



UC **SANTA BARBARA**

# Summer Research Academies

Summer Sessions

## 2024 Capstone Seminar

### List of talks

Thursday, July 25

#### **Fog Harvesting Efficiency of Pine Fascicle Inspired Needle Groups**

Melody Dai, Grace Ding, Samuel Zachary Yang

#### **Disability in Online News Media: Computational Analysis of the Effects of Perceived Capability and Disability Visibility**

Isabella Bian, Jiyoung(Stella) Lee, Ranya Rajesh Prasad

#### **Scandalous Values: The Effect of Sexual Scandals on Major Party Voter Values in the United States**

Grant Han, Annie Jung, Pranya Nagpal

#### **The Model Minority Myth: Impact of Media Stereotypes and Interactions on Asian American Academic Performance**

Seoyoon Lee, Evelyn Shen, Tristen Tanimura

#### **Searching for Bacteriophages and Determining Their Efficiency in Various Bacterial Hosts from Different Water Sources at the University of California, Santa Barbara**

Nathan Chang, Chloe Kiwon Lee, Kailey Lin

#### **Quantifying Doxorubicin Toward Adaptive Chemotherapy with an Electrochemical Aptamer-Based Biosensor**

Emma Chang, Arin Kathapurkar, Maya Ma

#### **Small Systems, Giant Speeds: Efficient, Reciprocal Swimming in Shear-Thinning Fluids Inspired by Trap-Jaw Ants**

Amber (Xuhong) Ding, Wallace Ruan, Evan Xiaofan Xu

#### **Digital Divide: Analyzing Political Intensity of Conflicting Comments on Social Media**

Isa Baig, Amy Yang

#### **The Relationship Between Family Research Council's Amicus Briefs and Supreme Court Justice Opinions**

Erika Li, Marinelly Rivera, Ruopan Song

#### **I Believe, Therefore I Can: Instructional Social Media Content, Engagement, and Self-Efficacy**

Yu Guo, Isabella Heras, Preston Lee

#### **Identifying the Host Range of E. Coli Bacteriophage P1 to Combat Antibiotic Resistant Bacteria**

Ansley Chen, Clementine Conway, Sharon Tak

#### **A Naked-Eye Detection and Sensitive Quantification Platform for Sensing Lead in Serum Using DNA Aptamer and Crystal Violet**

Sunny Light, Yiheng Wang, Samuel Young

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#### **Peeling Back the Layers: Advantage of Organic Peel Structures in Withstanding Compression**

Lilah Anders, Muzi Dou, Victoria Jian

#### **Temporal and Comparative Analysis of Morality in Hate Speech on X after the COVID-19 Lockdown and Roe v. Wade Reversal**

Manya Sinvhal Kumar, Bhavya Shanmugam, Michelle Yang

#### **From Diapers to Doctrine: The Church of Latter-day Saints' Influence on Mormon Family Structure**

Clarissa Huber, Olivia Long, Jacob Su

#### **Heat and History: The Influence of Historical Redlining Practices on Heat-Related Illnesses in Modern U.S. Cities**

Maisarah Aminah Dombrowski, Xinyao Sarah Huang, Esthyr Stucky

#### **Analyzing the Role of Parrotfish Presence on Algae and Coral Populations**

Shriya Kapavarapu, Vivaan Motwani, Luke Spencer

#### **Object Detection in Autonomous Cars: Utilizing Dynamic Vision Sensors with Spiking Neural Networks**

Yireh Ban, Rohit Mekkoth, Dylan Po

#### **Examining the Klamath and Shasta Dams: The Socio-Environmental Impacts of LargeScale Hydroelectric Structures**

Kyle Chan, Daniel Hannigan, Geoffrey Yang

#### **Ticking the Genetic Clock: Investigating clk-1 (RNAi) and Its Impact on C.elegans Development and Healthspan**

Eliana Andrea, Ayanna Jain, Owen O'Keefe

#### **Consumer's Willingness to Pay for Eco-Friendly Products**

Yu-Jui Chen, Ashley Parker, Bowen Tang

#### **Environmental Health Risks in Hispanic Agricultural Communities: Ambient Heat and Pesticide Exposure on Respiratory Health**

Kate Martinez, Arsema Mengistu, Madison Palacios Vera

#### **Whale this is Orca-ward: Analyzing Anthropogenic Threats on Resident Killer Whale (Orcinus Orca) Populations**

Perna Khemka, Amanda Lee, Sarah Sanchez

#### **Modeling the Auditory Sensory Framework Using Spiked Neural Networks and Bat Hearing to Advance Audio Classification**

Derin Gurses, Jason Yi

#### **Misleading Laughter: The Effects of Satirical Climate Change Misinformation on Generation Z**

Yailin Dircio Sanchez, Kaycie Nuckles, Metzy Solorio Vazquez

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#### **Death Before Life: Cancer and Mitonuclear Communications**

Aarush Katakam, Allyson Luo, Sreenidhi Maddineedi

#### **Complexity, Compound Lotteries, and You: An Analysis of Risk Aversion within Complexity**

David Meng, Claire Yu

#### **The Demand for Medical Interpretation: An Under-recognized Disparity in Healthcare**

Audrey Ke, Riya Kini, Jessie Jiaqi Zeng

#### **Examining the Relationship Between Plankton and Jellyfish Populations in the Polar and Temperate Oceans**

Kinsey Fuller, Reva Karri, Charles Watters

#### **Enhancing Real-Time Vision Systems: Integrating Dynamic Vision Sensors with Vision Transformers to Increase Computational Efficiency**

Sumedha Kumar, Oliver Su, Annabelle Yao

#### **Inhibitory Efficacy of Citric Acid, 4-Hydroxycoumarin, and Indole-3-Carbinol on *Escherichia coli* and *Staphylococcus aureus***

Kaitlyn Dai, Allie Jackson, Joshua Lee

#### **Optimizing Thrombin Recognition through Real-Time Electrochemical Aptamer-Based Biosensing**

Ieva Chepurina, Rohan Goyal, Nahily Yadeta

#### **#FreePalestine: How Media Richness Shapes Social Media Engagement in the IsraelPalestine Conflict**

Marilyn Carlon Espinoza, Angeliza Martinez, Jacob Tsang

#### **American to American't: Why Chinese Versus Korean Second-Generation Immigrants Challenge Christian Assimilation in the U.S.**

Karissa Cheng, Valerie Gu, Bethany Kim

#### **Got Your Tongue: Developing a Soft Robotics Ballistic Actuator Inspired by the Tongue Musculature of Salamanders**

Chloe Hung, Evan Limon, Gillian Mok

#### **From Policy to Perception: Media Sentiment in the Wake of Immigration Policies**

Nicholas Revenco, Munveer Singh, Zach Tan

#### **The Fight Against Resistance: Evaluating the Emergence of Antibiotic Resistance in Immunocompromised Versus Immuno-sufficient Patients**

Srujana Eadara, Esteban Esteves, Andrea Zhu



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**Combating Influenza: Low Cost Nucleic Acid Lateral Flow Assay to Improve the Diagnosis of Mutating Strains**

Thu Bui, Milton Alejandro Lopez Plascencia, Samarth Srikar

**Your Body, Their Choice: The Influence of Online Celebrity Endorsement on the Abortion Debate**

Chloe Fule, Andrew Li, Zhengyan Zhang

**When Rawls Gives You Lemons: Impacts and Philosophical Implications of Overturning the Lemon Test**

Oscar Jiale Liao, Stanley Liu, Sophia Mills

**Snakeskin Patterns Bio-inspire a Low-Friction Surface Design for Enhanced Efficiency and Durability in Robotic Locomotion**

Haoran Ding, Gustavo Inga, Joshua Pickens

**Prestige Counts: How Media Outlet Reputation Shapes Audience Political Bias**

Sophie Luo, Conor Pedroche, Jidong Xu

**Simulating the Effect of Single vs. Cocktail Antibiotic Treatments on the Normal Flora in the Human Gut Microbiome**

Nethra Iyer, Lucas Lum, Arjun Patel

**Rational Design of Electrochemical Aptamer-Based Biosensor for Estradiol Toward Determining Cocaine Addiction Susceptibility**

Genevieve Hiller, Yuncheng Liu, Jonathan Xue

**From Likes to Skills: How Online Engagement Transforms Offline Communication**

Matthew Ma, Jasmin Martinez, Natalie Shao

**Navigating the Fog: An Analysis of Ambiguity and Risk Aversion**

Nayeli Castrejon Peralta, Alex Luo, Andy Zhan

**The Global Waste Trade's Environmental and Human Health Impacts on Indonesia after China's 2018 Waste Ban**

Riley Adler, Yufang He (Susan), Stephanie Mo

**Silenced Strength: Modulating Muscle Function with Mutant Mitochondrial DNA and DRP-1 Inhibition**

Charlize Arriola, Jennifer Lee, Ly Ta

**A Pisastrophe: An Analysis of the Effect of Temperature on Pisaster Ochraceus in the Santa Barbara Channel and the Coast of Oregon**

Joseph Khang Duong, Olaf R. Karwasiecki, Mika Carmela Nasta

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#### **Topological Impact: Analyzing the Impact of Network Topology on Accuracy and Uncertainty Estimates of Bayesian Neural Networks**

Krishay Garg, Medha Nalakonda, Aryan Sanghi

#### **Clean Water Access and Food Consumption Habits in Rural and Urban India**

Nikhil Chakravarthula, Mia Hong, Jeanine Jayaraman

#### **Pride or Profit: Will Individuals Prioritize Their Ego or Material Benefit When Offered a Selection?**

Chloe He, Alyson Kang, Valeria Zamora Susano

#### **Cargill and Climate Change: Improving Environmental Regulations on Transnational Corporations**

Siddharth Gogi, Matthew Oates, Beatriz Wu

#### **The Mitochondrial Dilemma: Studying Cancer in *C. elegans* by Manipulating Mitochondria and Cell Death Mechanisms**

Adrienne Jung, Suhani Patel, Annika Thakur

#### **Kelp in Hot Water: Modeling the Impact of Temperature on Kelp Cover in the Channel Islands**

Kathryn Y Chen, Nikhil Ghosh, Rui J. Huang

#### **Biologically-Inspired Deep Spiking Neural Network for Enhanced Image Classification Using Foveal-Peripheral Vision**

Sanvi Adusumilli, Arjun Debnath, Akshay Murthy

#### **Impact of Nitrates and Atrazine in Drinking Water on Cancer Rates in Rural, SemiRural, and Urban Iowa Counties**

Savanah Dingle, Stella Fowler, Chloe Quan

#### **Risk Aversion and Economic Decision-Making: A Comparative Study of Immigrant and Native-Born Latinx Populations in the United States**

Ariel Ganelis, Brandon Wang, Kyle Yang

#### **Cultivating Change for the Nepalese: Analyzing the Impacts of the Climate Crisis on Farmers in Nepal**

Yongqi Huang, Benjamin Kim, Isabel Lee

#### **Exploring the Synergistic Effects of eat-3 Gene on Development of *C. elegans***

Kyunghwan Roh, Alexa Yi-Vigoda, Preston Zhang

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#### **Gender Equity? How Does Gender Bias in News Media Affect Election Results**

Lori Inez Gonzalez, Yanhuan (Helen) He, Eric Yu

#### **Hidden Pathways: Examining Occurrence Patterns of *Mobula birostris* Based on Environmental Factors**

Liam Ho, Katie Wang, Ivy E. Zhou

#### **Hidden Lifelines: How Education and Insurance Coverage Could Be the Key to Beating Cancer**

Sophie Lin, Melanie Ofelia Mireles, Hannah Sun

#### **Death vs. Development: The Power of the *Ced-3* Gene and its Absence**

Ashley Barreto Flores, Bryony Chan, Isabel Ramirez Lucas

#### **Swordfish-Inspired Hydrophobic Surfaces: Analyzing the Interaction Between Chemical and Mechanical Hydrophobicity**

William Gao, Siddharth (Sid) Thomas, Joy Xie

#### **Disconnected by Connection: Adolescent Social Media Usage and Offline Belonging**

Sarah Li, Elisa Sanchez Moctezuma, Ashley Wang

#### **Shifting Narratives: A Longitudinal Analysis of Media Trends and Public Attitudes on Homelessness**

Yash Chainani, Akshay Irudayaraj, Nathan Ye

#### **Evaluating the Predictivity of Environmental Factors in Modeling Whale Distribution on the California Coast**

Marcelis Gunn, Andrew Zhang, Naomi Zhao

#### **Invisible Boundaries: Analyzing How Residential Segregation Impacts Racial Disparities in Cancer Mortality Rates in the U.S.**

Julia Im, Olivia Rhee, Tommy Tang

#### **Impact of *clk-1* Gene Knockdown on Mitochondrial Mass and Developmental Rate in *C. elegans***

Aarush Abhyankar, Roger He, Saavi Ramteke

#### **Modeling Latch-Mediated Spring Actuation for Jumping Robots: A Comparative Analysis of Performance and Efficiency**

Tingwen Chen, Alexander Lee, Aiden Wang

#### **Synchronous vs. Asynchronous Communication in Virtual Student Interactions: Which Promotes Group Cohesion?**

Nayun Lee, Peiyang Li, Ziyi Liu

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#### **Analyzing Media Narratives with Machine Learning: Sentiment and Topic Alignment in Political Party Coverage of Trump's Rally Speeches**

Tashvi Bansal, Akhila Pasupunuri, Manushri Pitale

#### **Diving Into the Possibilities: Predicting Present and Future Migration Pathways of Whale Sharks in the Gulf of Mexico**

Chloéline Bourdu, Connor Chang, Chunman Li

#### **The Gentrification Trap: How Racial Shifts in California Perpetuate Poverty and Health Disparities**

Elayna Ong, Tsz Ki Phoebe Zhang, Annie Zhu

#### **Political Pastors: Investigating Election Denial Rhetoric Used by Greg Locke and Brian Gibson During and After the 2020 Election**

Shay Brandes, Paola Henriquez, Rongfei Mu

#### **Improving the Accuracy of Temporal Computing and nLSE Approximations**

Olivia Ahn, Lila Ancone, Ryan Yue

#### **Particles to Policy: Assessing Government's Impact on PM2.5 Disparities Across Various Income Demographics**

Kennedy Bateman, Kavin Shah, Caroline Wang

#### **Knowledge is Power: Identifying How Partial Asymmetric Information Regarding Product Value Affects Buyer and Seller Behavior in Transactions**

Andy Su, Samir Dalton Tinajero, Alexander Zhang

#### **Understanding Parkinson's Pathology: Real-Time Electrochemical Biosensor for Dopamine Quantification**

Rachel Fan, Ayetra Sarkar, Licheng (Jerry) Xu

#### **Novel Antibiotic COE-PNH2 Demonstrates Superior Efficacy Against Gram-Positive Versus Gram-Negative Bacteria**

Lillian Chang, Estrella Garrido Arana, Ximena Gonzalez

#### **Religion, Sedition, and Culture: How Supreme Court Sedition Cases During the Cold War Reflected American Religious Culture**

Angeles Garcia, Eldana Woldai, Isabelle Zhao

#### **Trainable Stochastic Surrogate Functions for Direct Spiking Neural Network Training**

Andrew Fan, Alan Tai, Chetan Thott

#### **Balancing Growth and Tradition: Deforestation's Cultural Impact on the Purépecha of Michoacán**

Ziyan Hua (Eric), Beebe Perez, Muyin Yu



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#### **People and Preferences: A Look at an Individual's Willingness to Lie**

Kayla Gicovi, Ethan Lai, Aaron Luc

#### **Got Milk?: Optimizing a Fluorescent Aptamer-Based Sensing Platform for Aflatoxin M1**

Dongmin Choi, Sonali Dhir, Qianru Huang

#### **Investigating Innovation: Determining the Susceptibility of Gram-Positive vs Gram-Negative Bacteria to Developing Resistance Against Coe-PNH2**

Nithya Devireddy, Avalon Dwight, Maribel Marquez

#### **Divided Loyalties: The Jewish American Campus Polarization on Israel-Palestine**

Kaya Brown, Yvonne(Yin) Guan, Kavya Wazhi

#### **Training and Inference Energy Consumption for Classification**

Spencer Diep, Aahan Ghose, Prashant Vaid

#### **A Comparative Study of Santa Barbara and Vigan: Analysis of the Effect of Wealth Distribution on Flood Vulnerability**

Ryan Chang, Mason Young, Zimo Zhang

#### **Investigating the Impact of Pod Geometry on Dispersal Inspired by Explosive Seed Dehiscence**

Mihir Kotbagi, Jesse Li, Mahir Shah

#### **Analyzing the Effectiveness of Ethos, Pathos, and Logos in Motivating Donations to Climate Change Mitigation Charities**

Everett Jin, Ariya Shah, Hanyang Xia (Hannah)

#### **Dauers on a Diet: Investigating the Relationship Between Dietary-Restriction-Induced DAF-16 and Mitochondrial Heteroplasmy in N2 and *uaDf5* Mutant *Caenorhabditis. elegans***

Chris Wang, Mengxuan (Michelle) Wang, Serena Zhao

#### **Swallowing the Pill: An Examination of the Impact of State-Level Policies on the Availability of Abortion Services in the United States**

Lauren Laxamana, Pragna Maddali, Sonya Shimpock

#### **Representation of Racial Minorities: An Analysis of Latin American Narrative Significance in American Films**

Ruvan Aluwihare, Rishi Gupta, Vanessa Liu

#### **Postmodernism and Watergate: The Loss of Truth Value in Information**

Coretta Foster, Yu Lan

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#### **Jumping Dynamics on Granular Media: An Analysis of Foot Structures and Materials Inspired by Camel and Fennec Fox**

Chloe Lagdameo, Jiayang Wang, Evangeline Yu

#### **Splitting the Difference: Investigating the Effects and Biases of Stock Splits on Investment Valuation**

Benjamin Broccoli, Philina Chen, James Xu

#### **The Effects of Mito-Nuclear Communication on Parkinson's: Observing *drp-1* RNAi Knockdown on *clk-1* Mutated *C. elegans***

Clara Choi, Anne Dong, Sarah Verma

#### **Exploring the Role that State Policies and Socio-Economic Status Plays in the Mental Health of Asian Population in the U.S**

Durva Dhok, Sophia Su, Evelyn Wang

#### **Narratives and Sentiment Regarding East Asians in U.S. Print News Media, 1850-2024**

Jasmine Dhaliwal, Qian(Emma) He, Christopher Voon

#### **Faith, Freedom, and Florida: The Surge of Religion in Florida's Public Education**

Jeremy Ahn, Jazmin Allen, Sofia Ramirez

#### **Quantifying the Effects of Upper-Surface Wing Heating in Commercial Aircraft: Albatross Bioinspiration and Simulations**

Haoyuan Deng, Nayan Gandra, Lucas Xu

#### **Effects of Information Provision on Student Food Wastage**

Sihan Chen, Aiden Lin, Bradley Tsou

#### **Cellular Aging: Investigating *ced-3* RNAi Knockdown in Wild-Type and Mutant Strains of *C. elegans***

Prisha Dalal, Aarya Dixit, Elena Yue Guo

#### **Breathing Easy: Real-Time Electrochemical DNA Aptamer-Based Sensor for Theophylline Toward Clinical Use Cases**

Kelly Lock, Trisha Subramanyam, Veerohit Veeravadivel Santhanalakshmi

#### **Queer Eye for the Straight Pop: Intergroup Perceptions of LGBTQ+ Content Consumption on Instagram**

Sydney Lee, Morgan Sun, Kimberly Viera

#### **Investigating the Efficacy of the Antibacterial COE-PNH2 Compared to Ampicillin on Inhibiting *Staphylococcus epidermidis***

Rachana Cheruvu, Lindsay Kim, Jason Sabol

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#### **How REDD+ and Similar Centralized Environmental Programs Affect the Economic Livelihoods of Indigenous Communities in the Yucatan Peninsula**

Christopher Kricorian, Jeremy Joshue Solano Beltrán, Magdalena St. Louis

#### **Analyzing the Effects of Depth, Temperature, and Degree Heating Weeks on Coral Bleaching in the Wider Caribbean**

Ziheng (Eric) Kuang, Molly Webster, Tiffany Zhu

#### **Integrating Dynamic Convolutions with Event-Based Asynchronous Neural Networks**

Condy Bao, Iris Li, Joelle Yang

#### **Electrochemical Aptamer-Based Biosensor for Real Time Quantification of Cortisol Levels in Interstitial Fluid**

Dhruv Kasarabada, Aadit Kaza, Misha Singla

#### **Mirror, Mirror on the 'Gram: Social Media Influencers and Female Teenagers' Self-Esteem**

Chloe Chan, Jiaen Li, Andrea Maciel

#### **De Novo Design of a Novel Therapeutic Peptide against *Staphylococcus aureus* Enterotoxin B**

Chloe Chen, Martin Huang, Varsitaa Srinivasan

#### **Soil and Solar: Analyzing the Social Barriers to Agrivoltaics Implementation in the United States**

Haeum Lee, Simran Karkhanis, Thaarak Sriram

#### **Analyzing the Effects of Coral Bleaching on Fish Biodiversity in the Moorea-Maiao Reef**

Jason Finnell, Anish Polakala, Hritvik (Rishi) Shrivastava

#### **Utilizing Predictive Algorithms to Convert from Temporal Code to Rate Code for Energy Efficient Computing**

Shreya Pramod Gajakosh, Allen Liu, Dristi Roy

#### **Electrochemical Aptamer-Based Biosensor Toward Real-Time Monitoring of Tau in Alzheimer's Patients**

Swara Ahire, Sadia Sultana, Hannah Umar

#### **"Voting isn't Needed After Trump Becomes King": The Polarized Reddit Political Community**

Aubrey Miller, Samyuktha Senthilnathan, Chanah Yin

#### **De Novo Design of Protein Binders to Inhibit the Enzymatic Component of *Clostridium perfringens* Iota-Toxin**

Alex Bertelli, Andrew Huang, Anusha Sundar