

# RESEARCH MENTORSHIP PROGRAM

2019 Research Symposium Proceedings





# Research Symposium

Wednesday, July 31, 2019

8:45 AM	<b>Opening Remarks</b> Lina Kim, Director of Pre-College Programs
8:48 AM	<b>Arnav Garg</b> Characterizing the Effects of an Electric Field on the $\text{SmTiO}_3/\text{SrTiO}_3$ Interface Near the Metal-Insulator Transition in Low-Temperature Conditions
9:00 AM	<b>Alexandra Huynh</b> Electric Field Effect on the Two-Dimensional Electron System of $\text{SmTiO}_3/\text{SrTiO}_3$ Thin Film Interface at High Temperatures
9:12 AM	<b>Mohammed Yusufali</b> Developing Circuits to Measure the Bolometric Response of Tunable Antenna-Coupled Intersubband Terahertz (TACIT) Mixers
9:24 AM	<b>Rachel Eizner</b> Characterizing the Bolometric Response of the Tunable Antenna-Coupled Intersubband Terahertz (TACIT) Mixer
9:36 AM	<b>Parker May</b> Simulating Catalytic Vanadium Oxide with Density Functional Theory
9:48 AM	<b>Anthony Zheng</b> Simulating the Oxidation of Methanol on Catalytic Vanadium Clusters with Density Functional Theory
10:00 AM	<b>Refreshment Break</b> Engineering Sciences Courtyard
10:20 AM	<b>Venugopal Chillal</b> Preictal Phase Detection of Neonatal Epileptic Seizures Through Machine Learning Analysis of EEG Signals
10:32 AM	<b>Anish Kachinthaya</b> Distance Based Human Detection and Masking Using Mask-RCNNs and RGB-D Sensors
10:44 AM	<b>Vrishab Krishna</b> Electroencephalography and Eye Tracking for Multimodal Biometrics in Brain-Computer Interfaces
10:56 AM	<b>Kartik Narang</b> Human Pose Tracking using Object Keypoint Similarity for Sports Technique Analysis
11:08 AM	<b>Theresa Lim</b> Spatiotemporal Analysis of Scooter-Share Availability in Washington D.C.'s Underserved Communities
11:20 AM	<b>Bharat Narayanasamy</b> Spatiotemporal Analysis of Shared Electric Scooter Distribution Operations in Washington D.C.
11:32 AM	<b>Nathaniel Li</b> Searching the Visual Cortex: Designing Virtual Reality Behavioral Tasks to Examine Visual Processing in Mice

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Wednesday, July 31, 2019

11:44 AM	<b>Lunch</b> On your own
1:00 PM	<b>Damla Onder</b> Panpsychism: Evaluating the Concept of Consciousness Through the Combination Problem
1:12 PM	<b>Luming Cao</b> Defining Belief: Bridging the Gulf Between Our Explicit Endorsements and Implicit Biases
1:24 PM	<b>Brian Chu</b> In-Between Believers: A Pluralistic Dispositional Perspective on Language-Less Beliefs
1:36 PM	<b>Anna Fu</b> Law and Violence: How Moroccan Legislation on Gender Based Violence has Failed to Combat Violence Against Women
1:48 PM	<b>Sandhya Murugavel</b> Improving Parent-Child Synchrony in Autism with Parent-Delivered Intervention
2:00 PM	<b>Dhruv Batra</b> Analyzing the Locations, Theories, and Costs Associated with Silent Trade
2:12 PM	<b>Kimberly Shirai</b> The Venezuelan Crisis: Effects of the International Community on Human Rights and Political Stability
2:24 PM	<b>Lillian Fu</b> The Subtle Message: The Implication of Cookbooks and Magazines on Women's Perception of Identity in the 1950s
2:36 PM	<b>Chris Liao</b> A Transformed Market: Indentured Servant Price Fluctuations in Colonial America from 1750-1765
2:48 PM	<b>Refreshment Break</b> Engineering Sciences Courtyard
3:08 PM	<b>Loren Lombardo</b> Activist Discourse from the Local to the Global Oil Economy
3:20 PM	<b>Anna-Marie Guenther</b> Comparing Decapod Crustacean Assemblages in the California Rocky Intertidal Zone Using Different Field Methods

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| 3:32 PM | <b>Jaden Orli</b><br>The Role of Parasites from Decapod Crustaceans in California's Rocky Intertidal Zone                              |
| 3:44 PM | <b>Sydney Rosen</b><br>Evolution of Cellular Differentiation in Cyanobacteria Through Diversity-Generating Retroelements               |
| 3:56 PM | <b>Srikrishna Dasari</b><br>A Protein Function Focused Approach to Accelerated Evolution in Cyanobacteria                              |
| 4:08 PM | <b>Ruchi Dixit</b><br>Mathematically Modeling Resource Distribution Among Offspring Through Calculating Eigenvalues of Leslie Matrices |
| 4:20 PM | <b>Joyce Li</b><br>An Insight Into the Properties of Non-Seymour Graphs  |
| 4:32 PM | <b>Phillip Kong</b><br>Synthesis of Sonidegib in Water   |
| 4:44 PM | <b>Rushil Mallarapu</b><br>Environmentally Efficient Synthesis of Boscalid via Aqueous Micellar Catalysis                              |
| 4:56 PM | <b>Closing Remarks</b><br>Lina Kim, Director of Pre-College Programs   |
| 5:00 PM | <b>End of Day One</b>  |

# Research Symposium

Thursday, August 1, 2019

8:45 AM	<b>Opening Remarks</b> Lina Kim, Director of Pre-College Programs
8:48 AM	<b>Jane Whellan</b> Analyzing the Effects of SELFI on the Appropriateness of the Social Media Activity of People with ASD
9:00 AM	<b>Noah Naranjo</b> Comparing Facebook Activity in Relation to Social Connectedness in Autism Spectrum Disorder and Typically Developing Groups
9:12 AM	<b>Cinthia Sanchez</b> Analyzing Social Media Usage and its Relationship with Social Connectedness within Latinx Communities
9:24 AM	<b>Natalie Jenkins</b> The Rise of the Alt-Right and its Surrounding Narratives: A Factor Analysis of Networks of Terror
9:36 AM	<b>Julian Samek</b> The Cultural Narratives of Jihadi Terrorism: Analyzing the Jihadi Worldview and its Origins to Improve Counter-Terrorism Policy
9:48 AM	<b>Refreshment Break</b> Engineering Sciences Courtyard
10:00 AM	<b>Nihar Hegde</b> Reducing Noise in Power Iteration Spectral Clustering Through L1-Regularized Autoencoders
10:20 AM	<b>John Tadeusz Piwinski</b> On The Application Of Breadth First Search Trees In Graph Kernels
10:32 AM	<b>Bing Han</b> Geometric Cohesiveness in Virtual Vibrotactile Rendered Objects: Examining the Influence of Size, Visual Anchors, and Rendering Approaches
10:44 AM	<b>Pranav Kakhandiki</b> Designing a Vibrotactile Mount for the Posterior Forearm Based on Biomechanical Cutaneous Propagation Patterns
10:56 AM	<b>Lunch</b> On your own

# Research Symposium

Thursday, August 1, 2019

2:00 PM	<b>Siddharth Ganesan</b> An Efficient and Centralized Multi-Robot System with Optimized Value Path Planning
2:12 PM	<b>Adit Shah</b> Improving the Efficiency and Scalability of Multi-Drone Coverage Systems with Decentralized Control
2:24 PM	<b>Nischal Sinha</b> The Self-Driving Pizza Car: Optimizing Control Algorithms for Autonomous Delivery Systems
2:36 PM	<b>Roger Elias-Marcellin</b> Identification and Analysis of Biomarkers Correlated with Traumatic Brain Injury
2:48 PM	<b>Stephanie Chen</b> Biological Approach to Discover the Biomarkers for Traumatic Brain Injury to Improve Patients' Diagnosis
3:08 PM	<b>Samarth Kadaba</b> Analysis of Fluorescently Stained Cellular Markers in the Kinetics of Stem Cell-Derived Motor Neuron Differentiation
3:12 PM	<b>Anna Vazhaeparambil</b> An Algorithm for Quantifying Stem Cells During Neural Differentiation
3:24 PM	<b>Refreshment Break</b> Engineering Sciences Courtyard
3:44 PM	<b>Andrew Hsu</b> Evaluation of Lbx1 and Lmx1b Expression in Stem Cell to Cortical Neuron Development
3:56 PM	<b>Martina Maria Rita Insulla</b> Determination of the Gene Expression during Differentiation of Mouse Embryonic Stem Cells into Excitatory and Inhibitory Neurons
4:08 PM	<b>Nicole Black</b> Characterization of the Role of Caspase Cleavage in the Tau Seeding Process in Alzheimer's Disease Using CRISPRi and FRET-Based Flow Cytometry
4:20 PM	<b>Anna Guo</b> Investigating Alzheimer's Disease: Phosphorylation and Dephosphorylation in Tau Protein Seeding
4:32 PM	<b>Julie Lampert</b> Epitaxial Growth and Characterization of (001) Cd <sub>3</sub> As <sub>2</sub> Thin Films on a Lattice Matched Buffer
4:44 PM	<b>Hamlin Wu</b> Thickness Dependence of the Charge Carrier Density of Cd <sub>3</sub> As <sub>2</sub>
5:00 PM	<b>Poster Session</b> Engineering Sciences Courtyard
6:00 PM	<b>End of Day Two</b>

# Research Symposium

Friday, August 2, 2019

8:45 AM	<b>Opening Remarks</b> Lina Kim, Director of Pre-College Programs
8:48 AM	<b>Lydia Neguse</b> Characterization of lattice distortion in SrTiO <sub>3</sub> grown on LSAT substrate through quantitative STEM analysis
9:00 AM	<b>Maanasi Vinay Nair</b> Validation Of Over-expression Of RBFOX1 Gene In Cultured Williams Syndrome Neurons Derived From iPSCs
9:12 AM	<b>Annika Baktha</b> Validation of the Overexpression of Ankyrin-2 in the Neurons of Individuals with Williams Syndrome
9:24 AM	<b>Michelle Kwan</b> Characterization of the Effects of Tau Uptake on Functional Connectivity of <i>in-vitro</i> Neuronal Networks
9:36 AM	<b>Jack Weinberg</b> Widespread APOE4 Inhibition is Toxic to Neurons in vitro
9:48 AM	<b>Selwyn Gu</b> Investigation of Bacterial Transformation Techniques for in vivo DNA Cloning in <i>Escherichia coli</i>
10:00 AM	<b>Refreshment Break</b> Engineering Sciences Courtyard
10:20 AM	<b>Jessica Lee</b> Analysis of In Vivo DNA Cloning Efficiencies Across Various Common Cell Competency Procedures
10:32 AM	<b>Pranav S. Moudgalya</b> Analysis Of Dissolved Metal Ions In The Disinfection Of <i>P. subcapitata</i>
10:44 AM	<b>Rohini Banerjee</b> Analysis of WRF Prediction Model Performance and its Spatiotemporal Characterization of Sundowners through PCA
10:56 AM	<b>Alana Ginsburg</b> Evaluating the Relationship between Two Extreme Wind Events in Southern California for Advancements in Forecasting
11:08 AM	<b>Camilla Martinez</b> Genetic Factors in the Evolution of Ostracod Mating Displays
11:20 AM	<b>Erin J. Youn</b> <i>Porichthys</i> ' Luminescence In Relation to Ostracod Consumption
11:32 AM	<b>Stella Huang</b> Applied Ecomorphology: Mammalian Calcaneal Morphology and Its Utilization in Paleoecological Reconstruction

# Research Symposium

Friday, August 2, 2019

11:44 AM	<b>Neusha Kharrati</b> Stabilization of Tetravalent Oxidation States across the Lanthanide Series
11:56 AM	<b>Lunch</b> On your own
1:12 PM	<b>Brian Ji</b> Characterization of Collimated Atomic Beaming for Ra-225 Qubit Isolation
1:24 PM	<b>Wilson Wu</b> Characterizing the Role of Syntactic Distributional Information in Grammatical Gender Assignment
1:36 PM	<b>Sherwin Lai</b> The Discriminative Function of Grammatical Gender: An Information-Theoretic Approach
1:48 PM	<b>Neil Kapoor</b> Computational Analysis of Protein-Protein Interaction Network Resilience and Evolution across Species
2:00 PM	<b>Shreya Ganti</b> Virtual Reality Visualizations of 2D Semantically Segmented Images with Conditional Generative Adversarial Networks
2:12 PM	<b>Laurn Tuo</b> From 2D to 3D: ICNet in Semantic Segmentation of Satellite Imagery for Virtual Reality
2:24 PM	<b>Nathan Juan</b> Universal Texture Extraction with a Generative Adversarial Network Trained on Manufactured Datasets
2:36 PM	<b>Joshua Tensuan</b> Analysis of Advanced Machine Learning Algorithms for the Configuration of Deep Brain Stimulation in Parkinson's Patients
2:48 PM	<b>Rahul Kumar</b> Utilizing Q-Learning to Optimize Deep Brain Stimulation
3:00 PM	<b>Patrick Kim</b> Comparing Conservation Efforts of Sustainably Certified Oil Palm Plantations and Protected Areas in Indonesia
3:12 PM	<b>Closing Remarks</b> Lina Kim, Director of Pre-College Programs
3:15 PM	<b>End of Day Three</b>