

Mathematical Sciences Dept.  
Stratton Hall 201

**PRESENTATIONS, 9:00am to 1:30pm**

**9:00am**

**Discovering User Patterns: The Role of Behavioral Clustering in Re-engagement Modeling**

Abhiram Yammanuru, Dan Nguyen, Duyen Le, Era Kalaja, Maria Anastasia Masouti  
Advisor: Randy Paffenroth, Donald Brown

**9:12am**

**Enhancing API Usability Through MCP Context Delivery for LLMs**

Minh Bui, Rodrigo Marcenaro, Keira Schoolcraft  
Advisor: Marcel Blais, Wilson Wong

**9:24am**

**Predicting Mental Health Using a Multimodal Approach**

Dorothy Alexander, Corryn Fisher, Brooke Powell  
Advisor: Shichao Liu, Oren Mangoubi, Kaitlyn Schneider

**9:36am**

**Exploring the Game of Cycles**

Kendall Snyder  
Advisor: Brigitte Servatius

**9:48am**

**Mathematical Modeling of the Neurovascular Unit Post Ischemic Stroke**

Madeline Gagnon  
Advisor: Andrea Arnold

**10:00am**

**Theta invariant for virtual knots**

Tyler Mitchell and Adam Mullaney  
Advisor: Sam Tripp

**BREAK, 10:15 am – 10:30 am**

**10:30am**

**A Neural Network Emulator for Agent-Based Malaria Models: Extracting and Selecting Key Predictors for Malaria**

Incidence Over Time  
Aidan Henbest, Floris Huiskers  
Advisor: Charlotte Fowler, Stephan Sturm

**10:42am**

**Scaling Diffusion Models to Large Sparse Graphs**

Gia Hien Pham, Weaver Goldman, David Dechantsreiter, Botao Hu  
Advisor: Oren Mangoubi, Fabricio Murai

**10:54am**

**Energy Preserving Neural Network for Liquid Crystal Problem**

Haoyan Zhong  
Advisor: Zhongqiang Zhang, Guanying Peng

**11:06am**

**AI-in-the-Box: Generating Snake-in-the-Box Constructions with AI**

Chase Carstensen  
Advisor: Daniel Reichman, Gabor Sarkozy

**11:18am**

**Deep Learning to Predict Staphylococcus Epidermis Biofilm Removal from Corresponding Biofilm-Detached Cell Images**

Michael Herchenroder, Brian Morissette, and Cameron Walters  
Advisor: Randy Paffenroth, Elizabeth J. Stewart

**BREAK, 11:30 am – 12:00 pm**

**12:00 pm**

**Topological Signatures for Structured  
Network Compression**

Jacob Molnia

Advisor: Herman Servatius, Taylor Andrews

**12:12 pm**

**Improving Ratemaking Profitability Using  
Auction Theory**

Josiah Aranovitch, Jose Salvador Aldana Pla,  
Macayle Wells

Advisor: Jon Abraham, Barry Posterro

**12:24 pm**

**Assessing the performance of an M-  
estimator for the SATE**

Avery Rabidoux

Advisor: Adam Sales

**12:36pm**

**Are Twist Knots Self-Dual?**

Mia Zheng

Advisor: Sam Tripp

**12:48pm**

***Simulating wave dynamics with modern  
Augmented Vertex Block Descent (AVBD)  
Algorithm***

Jenna Goodchild, Bohong Wang

Advisor: William Sanguinet

**1:00 pm**

**The Undervalued Variable: A Dynamic  
Approach to Risk Aversion in Lifecycle  
Portfolio Optimization**

Gianni Perea, Dylan Leung, Dmitriy Kim

Advisor: Jon Abraham, Barry Posterro

**1:12 pm**

**Development of a symplectic RKF scheme  
for integration of the geodesic equations  
on a manifold with applications to general  
relativity**

Bernard Ymeri

Advisor: William Sanguinet