Charles Kulick

Graduate Student – Mathematics

Graduate Education ——— The University of California, Santa Barbara

M.A. Mathematics, June 2023
Ph.D. Mathematics
 Expected: June 2025

Advisor: Dr. Sui Tang *Professor, Mathematics*
- My primary research interests are modern machine learning, statistical learning theory, and inference on dynamical systems.

Publications

1. **Permutations of point sets in $\mathbb{R}^d$ -** [arXiv]
   Alvaro Carbonero, Beth Anne Castellano, Gary Gordon, Charles Kulick, Brittany Ohlinger, Karie Schmitz
   Published: Australasian Journal of Combinatorics 2023.

2. **Learning particle swarming models from data with Gaussian processes -** [arXiv]
   Jinchao Feng, Charles Kulick, Yunxiang Ren, Sui Tang
   Published: Mathematics of Computation 2023.

3. **Data-Driven Model Selections of Second-Order Particle Dynamics via Integrating Gaussian Processes with Low-Dimensional Interacting Structures -** [arXiv]
   Jinchao Feng, Charles Kulick, Sui Tang
   Published: Physica D. 2024.

Presentations, Talks, Awards

- *AIMS Conference on Dynamical Systems, Differential Equations and Applications 2023*
  Talk: Scalable Data-Driven Interacting Particle System Modeling with Sparse GP

- *SOCAMs (Southern California Applied Mathematics) 2023*
  Talk: Scalable Agent-Based Modeling with Gaussian Processes

- *IMSI Expressing and Exploiting Structure in Modeling, Theory, and Computation with Gaussian Processes 2022*
  Poster: Scalable Model Selection of Particle Swarming Models with Gaussian Processes

- *NY State Regional Graduate Mathematics Conference 2023*
  Talk: Scalable Multi-Species Agent Based Modeling with Sparse GP

- *UCSB SIAM Seminar 2023 -* Data-Driven Discovery of Interacting Particle Systems with Gaussian Processes

- *UCSB Convex Analysis Seminar 2023 –* Duality and Optimization

- Panel: *Undergraduate Math Research Information Session –* UCSB, 2024

- Panel: *Incoming Graduate Panel on Research –* UCSB, 2024

- Panel: *Graduate School Career Paths –* UCSB, 2023

- Award: *SIAM Travel Award –* SIAM IS 2024 Conference

Undergraduate Education ———— **The University of Scranton**

Bachelor of Science, Mathematics
Minor, Computer Science
Graduation: June 2020

- Putnam Math Team
- ACM/ICPC Team Leader
- IEEE Autonomous Robotics Team

Presentations, Talks, Awards ————

Exploring Preference Orderings Through Discrete Geometry:

- *Joint Mathematics Meetings, Undergraduate Research Section* – Contributed Talk, 2020
- *MAA EPaDel Section Meeting* - Contributed Talk, 2019
- *Lackawanna and Luzerne Mathematics Symposium* - Contributed Talk , 2019
- *Moravian University Student Mathematics Conference* - Contributed Talk , 2020

Recursive Sequences in Hailstone Problems:

- *MAA EPaDel Section Video Meeting* - Contributed Talk, 2020

Awards:

- *Presidential Scholarship* – Awarded for academic achievement.
- *Frank O'Hara Award* – Highest earned GPA in the college each academic year.
- *Rose I. Kelly Award* - Exemplary achievement in academics and campus involvement.

Past and Present Work Experience ————

UCSB Teaching Assistant
  UCSB | Fall 2020 - Present
- Teach discussion sections, provide assessments, grade materials, and resolve conflicts for undergraduate math courses at both introductory and advanced levels.
- Provide cross-disciplinary connections with applied mathematics through hands-on projects and integration of modern programming materials.
- Consistently highly positive feedback from students in evaluations.

Lafayette College Research Experience for Undergraduates
  Lafayette College | Summer 2019
- Eight week mathematics research experience with a team of four undergraduates and two faculty advisors.
- Researched a problem in discrete geometry which led directly to a first publication.

Mathematics Tutor
  University of Scranton | 2018 - 2020
- Hired by Math Department to deliver individual and group tutoring for undergraduates.
- Provided private SAT/ACT/Math Subject Test tutoring for high school students.

Diversity and Inclusion

- UCSB Mathematics Directed Reading Program
  - Committee Member
  - Three-time mentor of diverse groups
- UCSB CCS Math Circle Activity Leader
- UCSB Undergraduate Math Club Overseer

Contact Information

- charleskulick@ucsb.edu

Professional Memberships

- SIAM, AMS