Brendan Shrader

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Education

Georgia Institute of Technology Aug 2025 – Present
Quantitative Biosciences Ph.D. *Atlanta, Georgia*

University of Central Florida (UCF), Burnett Honors College Aug 2021 – May 2025
Mathematics B.S., Computer Science Minor, 3.99 GPA *Orlando, Florida*

Research Experience

UCF Honors Undergraduate Thesis Jan 2024 – May 2025
University of Central Florida – Mathematics Department *Orlando, Florida*

- Extended work from the 2023 UCF Math REU (see below), with a focus on approximating disease endemicity across parameter ranges and developing theory for rational Lyapunov functions.
- Defended on April 1, 2025 and uploaded to UCF STARS on May 12, 2025; presented at several conferences, including an invited address at Joint Mathematics Meetings 2025; and paper in preparation to be submitted to the Royal Society Interface journal.

Georgia Tech Mathematics Research Experience for Undergraduates May 2024 – Jul 2024
Georgia Institute of Technology – School of Mathematics *Atlanta, Georgia*

- Worked in a group mentored by Prof. Rachel Kuske and Prof. Sam Brown to understand the dynamics of quorum sensing in the bacterium *Pseudomonas aeruginosa*, generating foundational results later utilized by postdocs for an NSF-funded research grant.
- Methods included differential equation model development, rigorous mathematical analysis, and numerical simulations and parameter sensitivity analysis using MATLAB.

UCF Mathematics Research Experience for Undergraduates May 2023 – Jul 2023
University of Central Florida – Mathematics Department *Orlando, Florida*

- Worked with Prof. Zhisheng Shuai on a epidemiological model implementing post-infection mortality.
- Used ordinary differential equation theory to study the existence of disease-free and endemic equilibria, their stability, and the existence of cyclic behavior.

Teaching Experience

Graduate Teaching Assistant Aug 2025 – Present
Georgia Institute of Technology – School of Mathematics *Atlanta, Georgia*

- Fall 2025: Graduate learning assistant for MATH 2106, Foundations of Mathematical Proof. Responsible for holding office hours, grading, and communicating with students about questions, grades, and course expectations.

Undergraduate Learning Assistant – Math Success Center Aug 2024 – May 2025
University of Central Florida – Mathematics Department *Orlando, Florida*

- Provided individual tutoring for students in classes ranging from College Algebra and Trigonometry to Abstract Algebra and Advanced Calculus.

Presentations

UCF Workshop on Mathematical Biology and Differential Equations Jul 2025
"Modeling social bacteria: quorum sensing, communities, and evolution." *Orlando, FL*

UCF Mathematical Biology Seminar, Orlando, FL Feb 2025
"The impacts of post-infection mortality and partial immunity on disease endemicity." *Orlando, FL*

Joint Mathematics Meetings 2025 Jan 2025
"Mathematical Modeling of Pseudomonas aeruginosa Quorum Sensing." Presented at the Pi Mu Epsilon Poster Session. *Seattle, WA*

Joint Mathematics Meetings 2025 (Invited Address) Jan 2025
"Investigating the impact of Long-COVID and other post-infection conditions on long-term infectious disease dynamics." *Seattle, WA*

Georgia Tech Mathematics REU Poster Session Jul 2024
"Mathematical Modeling of Pseudomonas aeruginosa Quorum Sensing." *Atlanta, GA*

UCF Mathematical Biology Seminar Apr 2024
"Investigating the impact of Long-COVID and other post-infection conditions on long-term infectious disease dynamics." *Orlando, FL*

UCF Student Scholar Symposium Mar 2024
"Global dynamics of a disease model with post-infection mortality and partial immunity." *Orlando, FL*

SMB MathEpiOnco 2024   Feb 2024
"Global dynamics of an SIR model with post-infection mortality and partial immunity."   *Virtual*

Joint Mathematics Meetings 2024   Jan 2024
"Global dynamics of an SIR model with post-infection mortality and partial immunity."   *San Francisco, CA*

UCF Summer Poster Showcase   Jul 2023
"Global dynamics of an SIR Model with post-infection mortality and reinfection."   *Orlando, FL*

Skills

Relevant Coursework:

- Mathematical Biology, Ordinary & Partial Differential Equations, Numerical Methods for Differential Equations, Linear Algebra, Abstract & Computational Algebra, Advanced Calculus, Probability & Random Processes, Object Oriented Programming, Computer Science.

Programming Languages & Tools:

- C, Java, Python, MATLAB, Maxima, LaTeX, Git, Conda, Jupyter Notebooks

Academic Honors & Awards

Georgia Institute of Technology:

- President's Fellowship   Apr 18, 2025

University of Central Florida:

- Hernandez Mathematics Award for Excellence in Undergraduate Achievement   Apr 13, 2025
- UCF Mathematics Department Advanced Calculus Award   Apr 17, 2024
- UCF Student Scholar Symposium Judges' Choice Award   Mar 27, 2024
- UCF College of Sciences Honors Undergraduate Thesis Competition   Mar 27, 2024
- UCF President's Honor Roll   Spring 2022 – Spring 2025
- UCF Provost Scholarship   Fall 2021 – Spring 2025
- Florida Bright Futures   Fall 2021 – Spring 2025