Yonatan Ashenafi

yonatanashenafi0@gmail.com

EDUCATION

Rensselaer Polytechnic Institute- Troy, NY

- Doctoral degree in Mathematics: May-2021

Thesis: Stochastic Hydrodynamics of Colonial Microswimmers

Advisor: Professor Peter R. Kramer

Rensselaer Polytechnic Institute- Troy, NY

- Master's degree in Applied Mathematics: August 2016-December 2018

EXPERIENCE

Postdoctoral Fellow, *Worcester Polytechnic Institute* *Fall 2023 –Present*

Worcester Polytechnic Institute, Worcester, Massachusetts

- Conducting research on Myosin transport over Actin fields
- Teaching Multivariable Calculus, Calculus 1, Calculus 2, and Ordinary Differential Equations.

Postdoctoral Fellow, *University of Alberta* *Fall 2021 – Summer 2023*

University of Alberta, Edmonton, Alberta

- Conducting research on the mechanisms of motion and suspension dynamics of raphid diatoms.
- Organizing a mathematical biology seminar (Fall 2021- Spring 2022)
- Teaching Calculus 1 for life sciences and Calculus 2 for physical sciences.
- Mentoring a master's student on a computer vision project for cell identification in suspension (Summer 2022).

Technical Fellow Intern, *General Electric (GE) Research* *Fall 2020*

GE Global Research Center, Niskayuna, New York

- Collaborating with the probabilistic design team on multiple projects on experimental design and additive manufacturing.
- Using Python for programming for Reinforcement Learning tasks.

Research Assistant, Dordt College *Summer 2014*

Undergraduate Research, Dordt College-Sioux Center, Iowa

- Collaborated with faculty and students on intellectually challenging projects.
- Trained in the statistical software, R, and utilized it to analyze data on the genetic expression of bacteria in various mediums.

Teaching Assistant, *Rensselaer Polytechnic Institute* *August 2016- May 2020*

Mathematical Sciences Department, Rensselaer Polytechnic Institute- Troy, New York

- Run recitation sessions and graded quizzes and exams for students in undergraduate mathematics classes.

Tutor, *Dordt College Library* *September 2013– May 2016*

Academic Skills Center, Dordt College-Sioux Center, Iowa

- Tutored students who requested assistance in the following classes: College Algebra, Calculus 1, Calculus 2, Multivariable Calculus, Linear Algebra, and Discrete Structures.
- Cooperated and communicated effectively with tutees, faculty, and staff.
- Gained more experience on the contents of the classes.

Services

- Mathematical Modeler at Mathematical Problems in Industry (MPI) workshop, University of Vermont, 2024.
- Volunteer grader for 34th annual math meet at WPI.
- Treasurer of Black Graduate Students Association at Rensselaer Polytechnic Institute for 2020.
- Presented at Biological Fluid Mechanics mini symposium of SIAM Life Science 2021 conference.
- Presented at Mathematical Biosciences Institute (MBI) Mathematical and Computational Methods in Biology Workshop 2020.
- Presented thesis research at Conference on Multiscale modeling in Biology at University of Minnesota Summer 2019.

- Presented thesis at Mathematical Biology Seminar Series Fall 2021.
- Organized a mini symposium titled “The Role of Noise and Asymmetry in Microscopic Life” at Canadian Applied and Industrial Mathematical Society (CAIMS) 2022.
- Attended AI for classroom workshop WPI 2023. Attended SIMIODE Webinars on tools for teaching differential equations.
- Presented my research at Biology and Medicine Through Mathematics (BAMM) 2024.
- Mathematical Modeler at Graduate Student Mathematical Modeling Camp, RPI-Troy, New 2017.

Awards

- Awarded Di Prima summer research fellowship for graduate research in the summer of 2018.
- Awarded Bill and Nancy Siegmann Applied Mathematical Modeling Prize for my thesis in May 2021.
- Awarded 2022 ASME CIE Advanced Modeling and Simulation Best Paper Award.

Professional Membership

- Society of Industrial and Applied Mathematics (SIAM).
- Society for Mathematical Biology.

Publications

- Yonatan Ashenafi and Peter R. Kramer. “Statistical Mobility of Multicellular Colonies of Flagellated Swimming Cells”. Bulletin of Mathematical Biology (2024).
- Yonatan Ashenafi “Stability and Spatial Autocorrelations of Suspensions of Microswimmers with Heterogeneous Spin”. Physics of Fluids (2022).
- Yonatan Ashenafi, Piyush Pandita, and Sayan Ghosh. “Reinforcement learning based sequential batch-sampling for Bayesian optimal experimental design” Journal of Mechanical Design (2021).
- Zheng, Peng et al. “Cooperative motility, force generation and mechanosensing in a foraging non-photosynthetic diatom.” Open biology vol. 13,10 (2023): 230148. doi:10.1098/rsob.230148
- Disselkoen, Craig, et al. "A Bayesian framework for the classification of microbial gene activity states." *Frontiers in microbiology* 7 (2016): 1191.

In Preparation

- Yonatan Ashenafi and Peter R. Kramer. “Asymptotic Analysis of Kinesis and Taxis for Colonial Protozoa”. Preprint.
- Yonatan Ashenafi and Jay Newby. “Mechanistic modeling of Diatom Mobility”. In preparation

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Programming Skills Python, MATLAB, C++, JavaScript, R