

Dilruba Sofia

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Education

University of Massachusetts Amherst

Expected May 2025

Ph.D.

Major: Mathematics

GPA: 3.66

Advisor: Leili Shahriyari

Research Field: Mathematical modeling of cancer

Coursework Summary: Statistical Computing, Nonlinear Dynamics & Chaos, Numerical Analysis, Partial Differential Equations, and Mathematical Models of Cell Biology

University of Massachusetts Dartmouth

May 2020

Bachelor of Science

Major: Mathematics

Minor: English Literature

CGPA: 3.66

Honors: Chancellor's list and Dean's list

Research Field: Epidemiological models and chemical reaction networks

Coursework Summary: Numerical Analysis, Applied Linear Algebra, Mathematical Modeling, Abstract algebra, Complex Analysis, Critical Methods in Literature, and General Psychology.

Experience

University of Massachusetts Amherst

August 2020– Present

Teaching Assistant

- Taught discussion sessions for Calculus sequences, and Differential Equations.

January 2020– Present

Research Assistant

- Worked on creating mathematical models of breast cancer and renal cancer microenvironment that utilized gene expression data analyses, differential equations, and global sensitivity analysis.

University of Massachusetts Dartmouth

September 2019 – May 2020

Mathematics Tutor

- Helped undergraduate students to conceptualize undergraduate level mathematical topics.

January 2020 – May 2020

Teaching Assistant

- Wrote class notes on board and prepared class handouts for creative writing class.

Texas A&M University

May 2019 – July 2019

Research Assistant

- Researched on finding steady states and mixed volume of chemical reaction network using ordinary differential equations.

Publications

- **D. Sofia**, Q. Zhou, and L. Shahriyari. Mathematical and Machine Learning Models of Renal Cell Carcinoma. Bioengineering, 10(11):1320, 2023.
- **D. Sofia**, N. Mohammad Mirzaei, and L. Shahriyari. Patient-specific mathematical model of the clear cell renal cell carcinoma microenvironment. Journal of Personalized Medicine, 12(10):1681, 2022.
- N. Mohammad Mirzaei, N. Changizi, A. Asadpoure, S. Su, **D. Sofia**, Z. Tatarova, I. K Zervantonakis, Y. H. Chang, and L. Shahriyari. Investigating key cell types and molecules dynamics in PyMT mice model of breast cancer through a mathematical model. PLoS computational biology, 18(3):e1009953, 2022.
- N. Mohammad Mirzaei, S. Su, **D. Sofia**, M. Hegarty, M. H Abdel-Rahman, A. Asadpoure, C. M Cebulla, Y. H. Chang, W. Hao, P. R. Jackson, et al. A mathematical model of breast tumor progression based on immune infiltration. Journal of Personalized Medicine, 11(10):1031, 2021.
- N. Obatake, A. Shiu, and **D. Sofia**. Mixed volume of small reaction networks. Involve, a Journal of Mathematics, 13(5):845–860, 2020.

Conference Presentations

Patient-Specific Mathematical Model of Clear Cell Renal Cell Carcinoma

Joint Mathematics Meetings, 2020

Mixed Volume of Modified Chemical Reaction Network

MathFest, 2019

Computational Skills

- Python
- Matlab
- Mathematica
- SQL

Languages

Native Language: Bengali

Working Language: English

Elementary Languages: Spanish, French, and Arabic

Activities

- Assisted in teaching in English Class
- Volunteered at UMass Dartmouth's food pantry
- Tutored at America Reads Counts program at UMass Dartmouth