A K M Rokonuzzaman Sonet

 Tallahassee, FL-32304, USA   asonet@fsu.edu   LinkedIn
 Website Google Scholar GitHub

🎓 Education

2020–Present	**Ph.D. Candidate in Financial Mathematics**, Florida State University, USA
	Thesis: The Heavy-Tail Phenomenon in Stochastic Gradient Descent Methods
	Advisor: Dr. Lingjiong Zhu
	Expected Graduation: Spring 2026
2020–2022	**Master of Science in Financial Mathematics**, Florida State University, USA
2015–2019	**Bachelor of Science in Mathematics**, University of Dhaka, Bangladesh

💼 Experience

2022–Present

Department of Mathematics, Florida State University

Instructor of Record

- Calculus and Analytic Geometry III — Fall 2025, Spring 2026
- Calculus and Analytic Geometry II — Spring 2025, Fall 2024
- Calculus and Analytic Geometry I — Spring 2024
- Precalculus Algebra — Spring 2022

Designed and taught Calculus I–III with full responsibility for syllabus, instruction, assessment, and grading for approximately 30 students each semester

Recitation Instructor

- Discrete Mathematics II — Fall 2023
- Discrete Mathematics I — Spring 2023, Summer 2022
- Calculus I — Fall 2022

Facilitated problem sessions, ran quizzes, office hours, coordinated with course instructor.

Assistant in Course Development

- Calculus and Analytic Geometry I — Summer 2024

Developed course content and assessments, aligned outcomes

Summer 2023, 2025

Graduate Research Assistant, Florida State University

Supervisor: Dr. Lingjiong Zhu

Project: The Heavy-Tail Methods in Machine Learning

- Investigate the emergence of heavy-tails in SGD methods (DE-SGD, SGDm, ASG, SHB)
- Study algorithmic stability under heavy-tailed noise
- Characterize tail indices and analyze their implications on generalization

Jan 2021–Dec 2021

Graduate Teaching Assistant, Florida State University

- Taught Pre-Calculus Algebra to approximately 30 students
- Assisted in teaching multiple undergraduate courses
- Helped students grasp fundamental concepts and enhance their problem-solving skills
- Led discussion sections, graded and held office hours
- Assisted with exam proctoring and student support

≋ Research Work

Research Interests: Stochastic Optimization and Machine Learning Theory, Algorithmic Stability and Generalization, Data Science, Computational Finance and Derivative Pricing, Financial Risk Management

Manuscripts - Preprint

- Dang, Thanh, Melih Barsbey, **A K M Rokonuzzaman Sonet**, Mert Gurbuzbalaban, Umut Simsekli, and Lingjiong Zhu (2025). *Algorithmic Stability of Stochastic Gradient Descent with Momentum under Heavy-Tailed Noise*. arXiv: 2502.00885 [stat.ML].

Manuscripts — In Preparation

- **A K M Rokonuzzaman Sonet**, Lingjiong Zhu, Emergence of Heavy-Tails in Homogenized Decentralized SGD
- **A K M Rokonuzzaman Sonet**, Lingjiong Zhu, The Heavy-Tail Phenomenon in Stochastic Gradient Descent with Momentum

💻 Presentations

- "Applied Quantitative Finance: A Project Portfolio", Quant Finance Boot Camp, Erdős Institute, *June 2025*. Topics: Portfolio Optimization, Delta Hedging, Option Pricing
- "Stock Price Prediction using LSTM", Data Science Boot Camp, Erdős Institute, *June, 2022*
- "Study of Some Basic Epidemiological Models", Department of Mathematics, University of Dhaka *December 2018*

🏆 Awards

- "Bettye Anne Busbee Case Graduate Fellowship", recognition for outstanding scholarly work leading to doctoral candidacy, Department of Mathematics, Florida State University, *2024*
- "FSU Math Distinguished Teaching Assistant Award", an award for outstanding TA performance, *2025*
- "University Scholarship" on undergraduate studies, University of Dhaka, *2019*
- "The Duke of Edinburgh's Award: Bronze Level", a global youth achievement award for individuals, *2018*
- "Champion, Intra-Department Mathematics Contest", Department of Mathematics, University of Dhaka, *2015*

📇 Professional Memberships

- American Mathematical Society (AMS)
- Society for Industrial and Applied Mathematics (SIAM)
- Bangladesh Mathematical Society (BMS)

📇 References

- **Lingjiong Zhu, Ph.D.** (Relationship: Ph.D. Dissertation Advisor)
  Professor, Department of Mathematics, Florida State University
  ✉ zhu@math.fsu.edu 📱 +1 (850) 644-2202
- **Giray Okten, Ph.D.** (Relationship: Ph.D. Dissertation Committee Member)
  Professor and Associate Chair for Graduate Studies, Department of Mathematics, Florida State University
  ✉ okten@math.fsu.edu 📱 +1 (850)-644-8713
- **Penelope Kirby, Ph.D.** (Relationship: Graduate Teaching Assistant Coordinator)
  Coordinator of Graduate Teaching Assistants, Department of Mathematics, Florida State University
  ✉ pkirby@fsu.edu 📱 +1 (850)-644-3737