MILIND GUNJAL

PhD in Mathematics | Aspiring Quantitative Researcher

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PROFESSIONAL SUMMARY

PhD in Pure Mathematics with 6+ years of experience in advanced mathematical research, teaching, and data analysis. Strong foundation in probability theory, statistical modeling, and programming (Python, R, MATLAB). Proven ability to work with complex abstract systems and translate them into computational models. Seeking to leverage analytical and programming skills in quantitative finance roles.

TECHNICAL SKILLS

- **Mathematical & Analytical:** Mathematical modeling, Statistical inference, Topological data analysis
- **Programming & Tools:** Python, R, MATLAB, C++, Git, LaTeX, Advanced Excel
- **Quantitative Finance & Statistical Methods:**
  - Time Series: ARIMA, ARCH, GARCH
  - Derivatives & Risk: Itô's Calculus, Black-Scholes model, Heston model, Value at Risk, Monte Carlo Simulation
  - Probability & Statistics: Martingale Systems, Copula Methods, Regression, Stochastic Process
  - Optimization Algorithms: Gradient Descent, Newton Raphson
  - Cryptography: RSA, Modular Arithmetic

EDUCATION

FLORIDA STATE UNIVERSITY — TALLAHASSEE, FLORIDA

MS in Mathematics (CGPA: 3.91/4) | PhD in Mathematics — 2019-2025

- **PhD Thesis:** Studied Monoidal 2-Categories, and Algebraic K-theory (Reviewed 110+ research papers and books to work on 3 projects in the field of homotopy theory and category theory. Axiomatized algebraic models for the K-theory of the generalized notion of algebraic gadgets like rings, spaces, varieties, called Waldhausen categories)
- **Relevant Courses:** Measure and Probability Theory, Logic, Type Theory, and the Mechanization of Mathematics

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH — KOLKATA, INDIA

MS in Mathematics and Statistics (BS-MS Dual Degree Course; KVPY Fellow, Valedictorian) — 2014-2019

- **MS Thesis:** Studied Line Bundles from Algebraic viewpoint (Set up foundations for comparing two areas of mathematics—algebraic K-theory and topological K-theory using Serre-Swan theorem)
- **Projects**
  - Modules over the ring of continuous functions: Explored algebraic structures and their topological implications
  - Representation Theory of $GL(2,F_q)$: Investigated finite group representations using field theory and character tables
  - Hilbert's Nullstellensatz: Applied it to algebraic geometry to ideal-variety correspondence

CERTIFICATIONS AND OTHER COURSES:

- Quant Finance Boot Camp certificate program by the Erdős Institute

SELECTIVE PUBLICATIONS:

- Symmetric Monoidal Bicategories and Biextensions (2024)(Reviewed 30+ research papers and books to analyze symmetric monoidal bicategories using algebraic models called biextensions)
- On a 2-determinant functor of Waldhausen Categories (In preparation, expected in 2025)
- Multiplicative comparison of Waldhausen and Segal K-theory using Chain Complexes (In preparation, expected in 2025)

PROFESSIONAL EXPERIENCE

TALLAHASSEE STATE COLLEGE — TALLAHASSEE, FLORIDA

Adjunct Faculty — 2025-Present

Taught advanced undergraduate math courses (Multivariate Calculus, Linear Algebra) for 110 students every semester; designed curriculum, and analyzed performance data to improve instruction

MERCOR — REMOTE

Math Expert at Project Rainforest — 2025-Present

Expertly trained and refined advanced LLMs to enhance their capability in solving and explaining mathematical problem. Authored and meticulously reviewed hundreds of complex math prompts, solutions, and explanatory rationales across diverse fields including abstract algebra, probability theory

FLORIDA STATE UNIVERSITY — TALLAHASSEE, FLORIDA

Administrative Teaching Assistant — 2023-2025

- Taught advanced undergraduate courses (Multivariate Calculus, Linear Algebra) for 30–100 students; designed curriculum, managed TAs, and analyzed performance data to improve instruction
- Led a team of 20 volunteers for the AMS sectional meeting with 500+ attendees
- Optimized workspace assignments for 100+ TAs under logistical constraints, improving operational efficiency

Instructor of Record/Lab Instructor — 2019-2023

Designed and taught multivariate calculus and linear algebra courses, focusing on real-world applications and computational methods used in quantitative modeling. Analyzed student performance data using Excel to identify trends and optimize instructional methods

SUMMER INTERNSHIP/ TALKS

- Talks: 9 different talks presenting advanced mathematical research throughout the US — 2021-2024
- Internship: Study of Simplicial and Singular Homology at CHENNAI MATHEMATICAL INSTITUTE — 2018
- Project: Evolutionary Game Theory at INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH, KOLKATA — 2017
- Project: Number Theory and Cryptography at SAVITRIBAI PHULE PUNE UNIVERSITY — 2016

AWARDS

- Dwight B. Goodner Mathematics Fellowship (Florida State University, 2024)
- Distinguished Teaching Assistant award (Florida State University, 2023)
- Director's Gold Medal (Awarded to the Department Topper at the end of the 5-year BS-MS program) (IISER-Kolkata, 2019)
- KVPY Fellow (Department of Science and Technology, Ministry of Human Resource Development, India, 2014-2019)

EXTRA-CURRICULAR

- Students' Affairs Council General Secretary (Sports) (2017-2018, IISER, Kolkata)
- Treasurer, Inquivesta 2016 (College fest, IISER, Kolkata)
- Captained Inter IISER Sports Meet for Gold (2018, Kabaddi), Gold (2016) & Silver (2017) in Volleyball