

Rajit Datta

14 Gola Mahal, Sadar Bazar, Barrackpore, Kolkata - 700120

☎ +919875377680, 📠 +918939080466 | ✉ rajitdatta93@gmail.com | 🌐 Rajit Datta | 🌐 rajit93.com

Summary

Quantitative Researcher with a Ph.D. in theoretical computer science and experience spanning equity long-short signal research, NSE index options trading, and interest-rate derivatives model validation at WorldQuant, AlphaGrep, and Goldman Sachs. Proficient in Python and C++, with a track record of building alpha signals, factor models, and backtesting systems.

Work Experience

WorldQuant Research

Mumbai, Maharashtra, India

QUANTITATIVE RESEARCHER

Sept 2025 - present

Long-Short equities portfolio research covering multiple geographies.

- Built and deployed 200+ alpha signals from fundamental datasets — sales, earnings, institutional flow — across global equity markets, achieving Sharpe > 1.
- Applied Barra multi-factor risk models to control for style/industry exposures and isolate idiosyncratic alpha in the long-short book.
- Engineered mid-frequency trading (MFT) signals from aggregated limit-order-book data.

Independent Research

QUANTITATIVE RESEARCHER

May 2026 - present

Nifty options strategy research in Python.

- Created end-to-end framework for backtesting intraday options strategies on 1 minute bars.
- Onboarded historical data starting 2021 from external sources.
- Created efficient signals and backtesting framework for quick research cycles (4-year backtest runs in 15 minutes on a standard 4-core, 16GB RAM machine).
- Ideated and constructed 30+ new features. Created a research pipeline to test them systematically.
- Created a strategy with Sharpe 2.8, Calmar 4.6 (over 4.5 years of backtest).

AlphaGrep Securities

Bengaluru, Karnataka, India

SERVED NON-COMPETE

Sept 2024 - Sept 2025

- Mentored students from my alma mater as part of LogicLabs. Gave lectures on quant finance topics and prepared them for interviews. Guided them through the application process and helped them get jobs.
- Read the book Active Portfolio Management by Grinold and Kahn and implemented the techniques in Python.

AlphaGrep Securities

Bengaluru, Karnataka, India

QUANTITATIVE RESEARCH AND TRADING

Apr 2023 - Sept 2024

Trading mid-frequency strategies in India NSE F&O. Co-managed a long-short equities portfolio (NSE Futures) as part of a five member team. Independently developed strategies on NSE index options, deployed and trading with AUM of 20Cr INR (~ 2.5M \$).

- Independently developed two NSE Index option strategies with Annual Sharpes 2.5, 3.8 and Calmar 3.2, 7.6.
- Improved risk management for options, reducing shock risk from 60% of margin to 40% of margin.
- Improved existing alphas and contributed 3 new technical alphas to the long-short portfolio, each having Annual Sharpe > 1.5.
- Performed post-market analysis and risk reporting tasks for the long-short portfolio.
- Briefly explored limit-order-book data for short-horizon signal ideas — early-stage investigation.

Goldman Sachs Group, Inc.

Bengaluru, Karnataka, India

VICE PRESIDENT, MODEL RISK MANAGEMENT

Aug 2021 - Feb 2023

I have worked with pricing models for interest rate products, exotics such as cancellable swaps, products with range accrual features, options on average of interest rates. I have a good understanding of stochastic calculus and am familiar with techniques such as American Monte Carlo and Whaley's approximation for pricing American options. I have validated the following models:

- Model for difference of swap rates (eg: 30yUSD - 5yUSD) using diffusion of Ornstein-Uhlenbeck processes.
- Validated a new model for pricing Caplets on daily compounding Risk Free Rates. The model is a generalization of the SABR model and uses a decay function to model the decaying volatility during the compounding period.
- Model for pricing Caplets on average of Risk Free Rates. Implemented an independent Monte-Carlo benchmark model based on diffusion of Hull-White model.
- Model for pricing Bond Future Options. Implemented an independent benchmark model based on diffusion of a SABR like model.
- Market making model for treasury future options which computes American premium using Whaley's approximation.
- CCAR PPNR Credit Flow model, based on regression, choosing appropriate macroeconomic factors as variables.

Education

Ph.D. in Computer Science

CHENNAI MATHEMATICAL INSTITUTE

- Advisors: Partha Mukhopadhyay (C.M.I.), V. Arvind (IMSc.)
- Solved a 10 year old open problem posed by a Gödel prize winner [FSTTCS'19].

Chennai, Tamil Nadu, India

Aug 2016 - July 2021

M.Sc. in Computer Science (CGPA: 9.06/10)

CHENNAI MATHEMATICAL INSTITUTE

- Courses: Complexity Theory, Approximation Algorithms, Optimization Techniques, Stochastic Processes.

Chennai, Tamil Nadu, India

Aug 2014 - July 2016

B.Sc. (Hons.) in Math and Comp. Sc. (CGPA: 7.17/10)

CHENNAI MATHEMATICAL INSTITUTE

- Courses: Algebra, Calculus, Probability Theory, Algorithm Design, Measure Theory, Machine Learning.

Chennai, Tamil Nadu, India

Aug 2011 - July 2014

Class 9th – 12th (Avg: 82.4% / 88%)

ST. AUGUSTINE'S DAY SCHOOL, BARRACKPORE

Barrackpore, West Bengal, India

May 2007 - April 2011

Skills

Probability & Statistics	Martingales, Markov Chains, Monte Carlo, Time Series Analysis
Programming	Python (Numpy, Scipy, Pandas, Scikit-learn, Selenium), C++, SQL, Git, Linux, Bash
Machine Learning	Regression, Classification, Feature Engineering
Quantitative Finance	Factor Models, Backtesting, Risk Management, Portfolio Construction
Stochastic Calculus	Brownian Motion, Ito's Lemma, Black-Scholes Formula
Algorithms	Graph Algorithms, Dynamic Programming, Newton Raphson

Awards and Contests

Regional Mathematics Olympiad

ORGANIZED BY NATIONAL BOARD OF HIGHER MATHEMATICS

ISI Kolkata, India

2010

International Collegiate Programming Contest (ACM-ICPC)

ASIA REGIONAL FINALS

IIT Kharagpur, India

2013

TCS Research Scholarship

AWARDED TO 40 STUDENTS ANNUALLY BASED ON ACADEMIC PERFORMANCE.

Tata Consultancy Services, India

2017

Invited Talks

Workshop on Algebraic Complexity Theory

TITLE: APOLARITY, IDEAL MEMBERSHIP AND ALGORITHMS

ICTS, Bangalore

Mar 2019

Highlights of Logic, Automata and Games

TITLE: MULTIPLICITY EQUIVALENCE TESTING OVER PARTIALLY COMMUTATIVE DOMAINS

Held Online

Sept 2020

Dartmouth Theory Group

TITLE: FAST EXACT ALGORITHMS USING HADAMARD PRODUCT OF POLYNOMIALS

Dartmouth College, New Hampshire

Oct 2020

Dartmouth Theory Group

TITLE: LOWER BOUNDS FOR MONOTONE ARITHMETIC CIRCUITS VIA COMMUNICATION COMPLEXITY

Dartmouth College, New Hampshire

May 2021

Extracurricular Activities

Indian Classical Music on Violin

Since 2011

Chess Tournaments (State Levels)

2009-10

Research and Publications

My research is focused in Arithmetic Circuit Complexity which is a sub-area of theoretical computer science. I have published 9 papers in conferences ranked A and A* (as ranked by C.O.R.E.). Full list of publications are tracked here.