

Sudeep Raja Putta

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BACKGROUND

Research experience in online machine learning, optimization and multi-armed bandits. Published three papers in theory ML conferences. Worked on execution research and portfolio optimization. Interested in Quantitative Portfolio Management, Portfolio Construction and Optimization, Price Impact modelling and Quantitative Trading.

EDUCATION

- **Columbia University** *Sept '19 - June '24*
Ph.D. in Operations Research GPA: 3.83/4
 - **University of Massachusetts Amherst** *Sept '17 - May '19*
M.S. in Computer Sciences, GPA: 3.91/4
 - **Indian Institute of Technology Kharagpur** *Aug '12 - June '16*
B.Tech in Computer Science, GPA: 8.88/10
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WORK EXPERIENCE

- **Quantitative Brokers** *June '23 - Aug '23*
Quantitative Research/Machine Learning Intern
Research on Dealer Selection in FX markets under the guidance of [Dr. Robert Almgren](#)
 - **Microsoft Research** *June '18 - Aug '18*
Research Intern, Machine Learning Theory Group
Research on Reinforcement Learning and Control Theory.
 - **Xerox Research** *July '16 - July '17*
Pre-Doctoral Researcher, Machine Learning & Artificial Intelligence Group
Research on Reinforcement Learning and Multi-Armed Bandits.
 - **IBM Research** *June '15 - Aug '15*
Research Intern, Cognitive Solutions Group
Research on Topic Models for Natural Language.
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RELEVANT PROJECTS AND RESEARCH

- **Dealer Selection in FX Spot Markets:** *Project at Quantitative Brokers with Dr. Robert Almgren*
 - Formulated a technique for quantifying the quality of execution and price impact of trading with different Market Makers in FX Spot Markets.
 - Created a contextual bandit algorithm that decides which Market Maker to pick based on quotes, market conditions, and order quantity in order to optimize execution price and minimize price impact.
- **Improving NYC Ambulance Staffing and Stationing:** *Winner of Cubist Hackathon 2023*
 - Led a team of four students and created a data-driven method for placing new ambulance stations in NYC to minimize response times.
 - Proposed a simple algorithm based on nearest neighbor clustering and gradient descent for finding new locations of ambulance stations. [Read more in the blog here.](#)
- **Online Portfolio Selection for Intraday Trading:** *Project in Prof. Sebastien Donadio's Algo Trading course*
 - Developed Long-Short intraday trading strategies based on Online Portfolio Selection Algorithms.
 - Performed Extensive backtests to validate the performance of these algorithms for intraday trading.
- **Quantitative Portfolio Management: M6 Competition**
 - Competed in replica [M6 Financial Forecasting Competition](#) as part of a course.
 - My portfolio had the best performance(highest information ratio) among all participants in the class.

- **Portfolio Optimization for Explainability Index** *Project in Prof. Ali Hirta's AI in Finance course*
 - Developed portfolio optimization techniques for a new unifying performance measure, [Explainability Index](#)
 - Implemented non-smooth, non-convex optimization with portfolio and performance measure constraints.
 - **Algorithms for Online Portfolio Selection:** *Research paper submitted to conference*
 - Proposed a new parameter-free algorithm for the online portfolio selection problem.
 - Proved a data-dependent $O(\log T)$ regret and Quadratic variation and First-order regret bounds.
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AWARDS AND HONOURS

- 2023 Winner of 2023 Cubist Systemic Strategies Hackathon
 - 2019 Tang Family Fellowship
 - 2018 Sudha Mishra and Rajesh Jha Scholarship
 - 2015 Winner of Xerox Research Innovation Challenge
 - 2012 Finalist for Aditya Birla Scholarship
 - 2012 All India Rank 281 in IITJEE
 - 2012 All India Rank 63 in AIEEE
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GRADUATE COURSEWORK

- **Quantitative Finance:** Algorithmic trading, Price Impact Modelling, Model & Trade Derivatives, Quantitative Portfolio Management, Statistical Inference for Finance, Asset Allocation, C++ for Financial Applications
 - **Machine Learning:** Machine Learning Theory, Advanced Machine Learning, Reinforcement Learning & Multi-Armed Bandits, Reinforcement Learning Theory
 - **Optimization:** Linear Optimization, Discrete Optimization, Optimization for Machine Learning, Convex Optimization, Dynamic Programming and Online Optimization
 - **Probability:** Stochastic Modeling, Probability Theory, Concentration of Measure
 - **Computer Science:** Design & Analysis of Algorithms, Randomized & Approximation Algorithms
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PUBLICATIONS

1. **Regret Bounds for Optimistic Follow The Leader: Applications in Portfolio Selection and Linear Regression** [\[paper\]](#)
S. R. Putta, and S. Agrawal.
Optimization for Machine Learning (OPT-ML) Neural Information Processing Systems (NeurIPS) 2023 .
 2. **Scale Free Adversarial Multi Armed Bandits** [\[paper\]](#)
S. R. Putta, and S. Agrawal.
International Conference on Algorithmic Learning Theory (ALT), 2022..
 3. **Exponential Weights on the Hypercube in Polynomial Time** [\[paper\]](#)
S. R. Putta, and A. Shetty.
International Conference on Artificial Intelligence and Statistics (AISTATS), 2019.
 4. **Pure Exploration in Episodic Fixed-Horizon Markov Decision Processes** [\[paper\]](#)
S. R. Putta, and T. Tulabandhula.
International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2017.
 5. **Exponential Weights on the Hypercube in Polynomial Time** [\[paper\]](#)
S. R. Putta
European Workshop on Reinforcement Learning (EWRL), 2018.
 6. **Efficient Reinforcement Learning via Initial Pure Exploration** [\[paper\]](#)
S. R. Putta, and T. Tulabandhula.
Multi-disciplinary Conference on Reinforcement Learning and Decision Making (RLDM), 2017.
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PROGRAMMING EXPERIENCE

Programming Languages/ Tools - Python, C/C++, R Q/KDB+, CVXPY, Gurobi, Mosek