OMKAR PATHAK

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EDUCATION

University of Maryland, College Park August 2022 - May 2026
Bachelor of Science, Computer Science and Mathematics *College Park, MD*
Cumulative GPA: 3.8/4.0, **SAT**: 1580/1600
Coursework: (Ψ, Ω denote graduate-level, upcoming) Programming Languages, Algorithms, Compilers, Theory of Computation, Artificial Intelligence$^{\Omega}$, Design & Analysis of Algorithms$^{\Omega}$, Multivariable Calculus, Linear Algebra, Probability Theory, Stochastic Processes$^{\Psi}$, Real Analysis, Computational Methods$^{\Omega}$, Financial Markets
Activities: Smith Investment Fund, Computer Science Departmental Honors

EXPERIENCE

RBC Capital Markets June 2024 - August 2024
Quantitative Trading Intern *New York, NY*
Rates trading desk (interest rate swaps, US Treasuries, rates volatility derivatives)
Implemented machine learning models (random forest, XGBoost) to predict trade cover prices, achieved **83%** accuracy
Added rates derivative products to swaps automated market making algorithm, saving traders ∼**12** minutes per quote
Participated in mock systematic proprietary trading of rates products, ending with $**80,000** PnL

Supervised Program for Alignment Research February 2024 - Present
AI Researcher *Berkeley, CA*
Conducting AI safety research on opponent shaping in reinforcement learning under Christian Schroeder de Witt
Developing novel method to make opponent shaping less noticeable in response to detection in multi-agent settings

Carrington Capital Management May 2023 - August 2023
Quantitative Research Intern *Greenwich, CT*
Implemented large language models (Llama-2-7b, BERT) for sentiment analysis on email data to predict loan payment timelines and returns of mortgage-backed securities, achieving **85**% exact match (**HuggingFace**, **PyTorch**)
Developed centralized dashboard (**Flask**, **SQLAlchemy**, **React.js**) to display mortgage data and related statistical analytics, saving ∼**12** hours per monthly report creation

University of Maryland, Department of Computer Science January 2023 - May 2023
Teaching Assistant *College Park, MD*
Designed and graded proof-based problem sets, quizzes, and exams for Discrete Structures class with **300** students
Taught weekly discussion sections and office hours to reinforce student knowledge and introduce additional material

University of Maryland, Smith Investment Fund October 2022 - Present
Quantitative Analyst *College Park, MD*
Developing infrastructure to create, test, and trade with signal-based alpha strategies; using **Python** for infrastructure and **Alpaca API** for live equity data collection
Implemented factor/portfolio models (Fama-French, Capital Asset Pricing Model, Mean-Variance analysis) and back-tested resulting strategies on minute-candle data

Morgan Stanley July 2021 - June 2022
Software Engineering Intern *New York, NY*
Worked on global Enterprise Computing SRE Team to design and develop database-related server deployment manager
Added functionality for **3000** servers (**Python**, **Flask**); created frontend to display server metadata (**Angular**)

Montefiore Medical Center, Duong Lab April 2021 - July 2022
Machine Learning Researcher *New York, NY*
Developed object-detection deep learning models to classify between small bowel inflammatory bowel disease (IBD) features and pinpoint damaged regions in capsule endoscopy images (**PyTorch**), achieving **87**% accuracy
First study using object detection models to classify between and localize damaged regions between IBD features

PROJECTS

Low Latency Order Book
Developed limit order book to add, cancel, and update limit orders using a price-time matching algorithm
Implemented multithreading and LMAX Disruptor-based ring buffer for order execution using performant **C++**

SKILLS

Software Languages C/C++, Python, Java, Rust, HTML/CSS, JavaScript, Angular, React
Tools NumPy, Pandas, TensorFlow/Keras, PyTorch, Linux, Windows, Visual Studio Code, Git