

# VIRESH MITTAL

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## EDUCATION

### The University of Chicago

BS in Computer Science, BA in Economics

Expected, June 2027

GPA: 3.99/4.00

- **Awards:** Dean's List, National Merit Scholar; ACT: 36/36
- **Relevant Courses:** Database Systems, Math for Machine Learning, Scientific Visualization, Systems Programming, Algorithms, Linear Algebra, Discrete Math, Statistical Theory and Methods (graduate), Mathematical Probability
- **Financial Markets Program:** Accepted to a 3-year program to develop quantitative finance skills at Chicago Booth
- **Leadership & Activities:** Algo Group (Head of Technology), Maroon Capital Quantitative Finance Organization (Board), South Asian Students Association
- **IMC Launchpad:** Invited to a 3-day, highly selective program to learn about software engineering at IMC Trading

## EXPERIENCE

### SAND Lab

Chicago, IL

Undergraduate Researcher

January 2025 – Present

- Enhancing AI-generated music detection under Prof. Ben Y. Zhao and Prof. Heather Zheng
- Working part-time during the academic year (10 hrs/week), and full-time during Summer 2025 (40 hrs/week)
- Designing scalable ETL pipeline in Python using Apache Airflow and PostgreSQL to find and store generative audio
- Improved performance of tool to calculate local clustering coefficients for network graphs by 24x

### Icosa Computing

New York, NY

Software Engineer Intern

June 2024 – December 2024

- Architected a secure REST API for a portfolio optimization algorithm, creating endpoints for first customer access
- Created technical documentation for updating and utilizing API, allowing future developers to expand endpoints
- Identified and fixed key bottleneck in LLM prompting pipeline via profiling analysis, reducing runtime by 2.6x
- Wrote benchmarking script based on GPQA, caching intermediate results to reduce cost in evaluating LLMs by 50%

### University of Chicago Institute of Politics

Chicago, IL

Software Developer

January 2024 – May 2024

- Collaborated on a web crawler to find open-source intelligence for the Anti-Human Trafficking Intelligence Initiative
- Utilized BeautifulSoup to find 100+ possible addresses and numbers for sex trafficking, pipelining data into MySQL

### De Nora Tech, LLC

Concord, OH

Software Engineer Intern

June 2023 – September 2023

- Implemented a document processing and RAG system using OpenAI API and Azure Vector DB, reducing loss of institutional knowledge across DeNora's thousands of employees and surpassing cost goals by 6x
- Automated deployment via GitHub Actions workflow that builds and publishes Docker images to an internal web app

## TECHNICAL PROJECTS

### Hermes: Automated Trading Bot | Python, NumPy

- Utilized ETF arbitrage and event-driven trading to earn 6th place in Case 1 at the 2025 UChicago Trading Competition

### Hoops Head2Head Online Game | Python, React.js, Neo4j, Google Cloud Platform

- Serving 150+ users/month with a multiplayer game to connect 2 NBA players via mutual teammates
- Scraped player data into Neo4j AuraDB; designed central multiplayer platform using Python, Flask, and WebSockets
- Built frontend with React.js and ChakraUI; deployed on GCP Compute Engine with NGINX and Cloudflare DNS

### LZW File Compressor | C, Bash, UNIX

- Engineered a lossless file compression suite using an improved version of variable-width Lempel-Ziv-Welch encoding
- Wrote unit testing framework in Bash; achieved 15% higher compression ratios than standard implementations

## SKILLS

**Programming Languages:** Python, Java, C, JavaScript, Rust, HTML5, CSS, R, SQL, Cypher

**Technologies:** Git, SVN, AWS, Google Cloud, React.js, FastAPI, Flask, WebSockets, Neo4j, PostgreSQL, Numpy, PyTorch

**Languages:** English, Hindi, Spanish

**Interests:** Cleveland sports, cooking, personal investing, custom mechanical keyboards