Ritvik Thakur

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Education

University of Maryland - College Park College Park, MD

Bachelor of Science in Computer Science, Double Major in Mathematics; GPA: 3.91 *May 2026*

Relevant Coursework: Computer Systems, Data Science, Computer Vision, Discrete Structures, Algorithms, Object Oriented Programming, Organization of Programming Languages, Linear Algebra, Calc III, Differential Equations

Experience

Undergraduate Researcher August 2023 – Present

University of Maryland - College Park *College Park, MD*

- Developed predictive models with **Python** to forecast company lobbying on environmental policies.
- Boosted strategic decision-making by extracting actionable insights from predictive analyses of company-specific factors such as size, sector, and location.

Software Engineer Intern Nov. 2022 – June 2023

Washington Software *Gaithersburg, MD*

- Developed a **React Native** essay-writing app with **Firebase** integration, utilizing OpenAI's **GPT API** for resource searching, citations, and comments; managing the full development lifecycle across 3 months.
- Organized Scrum team of 4 members using **Jira**, while also creating **UML** diagrams and flowcharts for projects.

C++ Team Leader Aug. 2021 – Feb. 2023

Kids for Code *Rockville, MD*

- Created curriculum, course materials, and assignments for a Virtual tutoring service targeted at children from the ages of 8 to 12. Service taught courses for **Python**, **C++**, **Java**, and **HTML CSS**.
- Managed the C++ branch and directed 10+ teachers with **1900+** students from 11 different countries.

Summer Intern July 2021 – Aug. 2022

Nobel Explorers *Remote*

- Collaborated within an intern team to develop a professional website for a Pakistani restaurant.
- Designed and delivered comprehensive troubleshooting and internet safety presentations, providing training to **30+** interns and employees, contributing to enhanced cybersecurity awareness.

Projects

Outfit-ID (WIP) | *React, Node.js, Express, Python, Firebase, AWS S3, Bootstrap*

- Designed a full-stack web application with **React.js** frontend and **Node.js/Express** backend.
- Integrated **Firebase** for authentication and **Firestore** for database management to store user-specific datas.
- Utilized **AWS S3** for secure and scalable image storage, ensuring efficient handling of large image uploads.

Robust Vision System | *Python, Matplotlib, numpy, OpenCV*

- Engineered an **AI**-driven vision system by developing and training a custom **Gaussian Mixture Model (GMM)**, refining ∼**15** parameters using **Expectation Maximization (EM)** algorithms to achieve **95%** accuracy in segmenting and isolating orange balls from complex image backgrounds.
- Accurately estimated object distance from the camera with a margin of error below **5%**, leveraging **machine learning**-based image analysis techniques and geometric transformations in **OpenCV** and **NumPy**.

Drone Facial Recognition - BitCamp | *Python, React, OpenCV, dlib, Flask*

- Enabled real-time streaming and web interactions for drone video feed achieving a processing latency under **500ms**.
- Utilized **OpenCV** for real-time facial detection, landmark analysis and score calculation.
- Came in 3rd out of **500+** participants.

Airplane Strike Data Analysis | *Python, NumPy, Pandas, Matplotlib*

- Analyzed a dataset of 200,000+ airplane strike incidents, uncovering key trends and patterns in aircraft damage, frequency, and flight phases.
- Conducted data cleaning and filtering using **Pandas** to isolate specific trends for accurate analysis.

Technical Skills

Languages: C, C++, Java, Javascript, HTML, CSS, Python, Dart, R, OCaml, MIPS Assembly, Bash, Matlab
Frameworks/tools: React, Pyplot, Pandas, NumPy, Firebase, NoSQL, OpenCV, MediaPipe, Flask, Simulink