Aarush Agarwal

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EDUCATION

Carnegie Mellon University   **Pittsburgh, Pennsylvania**
Bachelor of Science in Artificial Intelligence, School of Computer Science   *Expected Graduation, May 2027*
- **QPA:** 3.76, **CMU School of Computer Science Dean's List**
- Past Coursework: Discrete Mathematics, Imperative Computing
- Current Coursework: Functional Programming, Artificial Intelligence: Repr. and Prob. Solving

Mountain View High School   **Mountain View, California**
High School Diploma   *August 2020 - May 2024*
- Weighted GPA: 4.64/4.00, Unweighted GPA: 4.00/4.00

EXPERIENCE

Carnegie Mellon Physics Lab   **Pittsburgh, Pennsylvania**
Machine Learning & CUDA Research Assistant   *Aug 2024 - Present*
- Engineered **CUDA optimizations** for an object condensation loss function within a graph neural network framework, **enhancing the detection of particle collisions** in CERN experiments.
- Currently authoring a paper focused on optimizing the **K-Nearest Neighbors (KNN)** algorithm using spatial partitioning and **kd-trees**, achieving up to a **30x improvement in speed** for low-dimensional spaces.

PROJECTS

Rover   **Mountain View, California**
Project Lead   *Aug 2021 – July 2023*
- Engineered a semi-autonomous rover capable of executing detection-based missions, built using a NVIDIA Jetson Nano with a rocker-bogie suspension for enhanced terrain adaptability.
- Developed a machine learning-based system for collision avoidance, utilizing **object recognition and distance estimation** to ensure safe navigation.

AEye Health   **Mountain View, California**
ML Lead   *Jun 2023 – Aug 2023*
- Developed an innovative solution to address digital eye strain by leveraging machine learning techniques through the OpenCV library. Used Haar cascades and dlib while **developing algorithms to analyze blink frequency and patterns**, using user data to calibrate and detect insufficient blinking.
- Integrated model into a sleek, modern user interface, providing an effective and user-friendly tool to mitigate eye strain.

MV Test Tracker   **Mountain View, California**
Project Lead   *Feb 2023 – Jan 2024*
- Programmed an optimization algorithm to achieve uniform test distribution across the month
- Optimized Firebase server calls, **reducing overhead by 40%**
- Gained overwhelming support from district administration and **50+ teachers**

ACTIVITIES AND LEADERSHIP

Mountain View High School CS Department   **Mountain View, California**
Teaching Assistant for APCS and Adv CS (Data Structures & Algorithms)   *Aug 2021 – May 2023*
- **Mentored 15+ students** over 2 years and developed advanced curriculum for high-achieving students

Algorithmic Programming Club   **Mountain View, California**
Founder & President   *Nov 2022 – Jan 2024*
- Lead **25+ club and board members**. Taught **7 students** who reached USA Computing Olympiad Silver **within 6 months**.

Artificial Intelligence Club   **Mountain View, California**
Vice-President, Head of Curriculum   *Aug 2022 – May 2024*
- Designed curriculum regarding basic regressions, neural networks, bias & variance, and model selection.
- **Mentored two teams to semifinalist positions** in a national competition.

SKILLS

Languages: Java, Python, JavaScript, C++, C, C#, Lua, SQL, CUDA, Bash, Zsh, Swift,
Software: Jupyter, Tensorflow, Keras, PyTorch, OpenCV, Numpy, Vue.js, React, Firebase, Git, Linux