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Karthik Mittal

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Education

Carnegie Mellon University — **Pittsburgh, PA** — **Aug 2022 – May 2026 (Expected)**
- **B.S. in Computer Science, QPA: N/A**
- **Coursework:** Mathematical Foundations for Computer Science, Matrix Theory, Principles of Imperative Computation

James Logan High School — **Union City, CA** — **Aug 2018 – May 2022**
- Superintendent's Honor Roll, Salutatorian, GPA: 4.0/4.0
- **Coursework:** Multivariable Calculus, Differential Equations, AP Computer Science, AP Statistics, AP Calculus BC

Employment

Twitter for Good — **San Francisco, CA** — **July 2021-Aug 2021**
- Organized census data in the SF Tenderloin based on demographic characteristics using ML and visualization techniques.

Ocean Genomics — **Pittsburgh, PA** — **Jun 2021-Aug 2021**
- Optimized runtime by 7.5% for drug prediction model through ML and statistical analysis on RNA-seq data.
- Integrated different feature selection algorithms under genetics PhD advisor to maximize pipeline efficiency.

Mpathy Software — **Jan 2021 - Jul 2021**
- Developed backend electronic health record services using natural language processing and generators.
- Built front-end integrations (HTML, PHP) for easier user experience to support clinicians in tracking patient records.

H4E Network — **Jan 2021 - Apr 2021**
- Formed ML model predicting wildfire frequency from carbon emissions to accelerate climate change investment.
- Supervised group of ten as a project manager and built the backend infrastructure for project website.

Languages and Technologies

- **Languages/Frameworks:** Python, C, C++, R, HTML, CSS, Java, Solidity, Git, Unix
- **Fields:** machine learning, AWS, computational biology, data science, statistical analysis, mathematical modeling

Technical Experience

Personal Projects:
- **OCIP-MR:** Built a front-end service that detects SNPs correlative with an increase in leukemic stem cells (based on GWAS), aimed at increasing remission rates for chemo patients (Flask, Python, Java).
- **Disease Outbreak Detection Website:** Clustered different locations extracted from news headlines to determine points of outbreak, through visualization libraries (Basemap) and ML clustering algorithms (Python, Django, React).
- **Student Recommendation Service:** Built platform to give extracurricular opportunities to students based on academic interests, currently in Bay Area high schools (Flask, React, AWS, JS).
- **Riboswitch Engineering Research (in progress):** Training a neural network from wet lab data to develop novel synthetic riboswitches that increase fermentation efficiency, and subsequently biofuel production (Python, R, Wet lab).

Research Projects:
- **Cancer Pathway Identification:** Implemented ML clustering algorithms and PCA to group genetic variations and discover biological pathways causative for breast cancer, under a Cambridge professor (Python, R).
- **COVID-19 Mortality Correlation Platform:** Identified significant relationships between country health index, demographic factors, and COVID-19 mortality rate through decision trees and random forest, under an MIT professor (Python).
- **Multiplication Transducers Research:** Determined the smallest path size of multiplication transducers (automata performing efficient base multiplication) with a restricted digit set (C++, Python).

Additional Experience and Awards

- **AWS Solutions Architect Associate** Certification, AI Programming with Python Nanodegree (Udacity)
- Co-coordinated a paid eight-week course teaching twenty students C++ and competitive coding algorithms.
- Performed data analysis on COVID-19 detection app information with graduate students, as a Junior Fellow for PathCheck.