Esha Karlekar

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EDUCATION

University of California, Berkeley *Graduating: December 2025*

B.S. Electrical Engineering and Computer Sciences (EECS); Minor in Public Policy

GPA: 3.7/4.0; **Coursework**: CS170 (Efficient Algorithms/Intractable Problems), CS188 (Intro to AI), CS61C (Computer Architecture/Machine Structures), CS61B (Data Structures/Algorithms), CS70 (Discrete Math/Probability), EECS 16A & 16B (Electrical Engineering & Linear Algebra), CS61A (CS Fundamentals), CS195 (Ethics of Computer Technology)

Thomas Jefferson High School for Science and Technology

GPA: 4.52/4.0; **Coursework:** Mobile/Web App Dev, Machine Learning, AP Statistics, Multivariable Calculus, Discrete Math

EXPERIENCE

Netflix, Software Engineering/Machine Learning Intern *May 2024 – Aug 2024*
- Leveraged ML forecasting models to detect anomalies in time series data of authentication traffic in order to prevent account takeover and fraud on the Netflix site; achieved an estimated 54% increase in fraud detection recall
- Developed ETL scripts w/ Spark for persistent storage and use of model outputs in existing fraud detection systems

SpaceX, Software Engineering/Machine Learning Intern *Jan 2024 – Apr 2024*
- Used machine learning (DNNs, XGBoost) and parallelizable heuristic decision tree search methods (MCTS) applied to the fundamentals of orbital dynamics to create flight path trajectories and speed up mission planning
- Resulted in a 10x speedup in trajectory computation and a 50-75% increase in the accuracy of a given neural net prediction
- Worked on existing tech stack for simulating trajectories in object-oriented C++ in order to integrate model results

MITRE, Applied Machine Learning Intern (Transitioned to Part Time Engineer Fall 2023) *May 2023 – Dec 2023*
- Used generative AI large language models (BART, GPT-J, LLaMA) to create summarization/query tools for government satellite records, impacting 3 governmental organizations; created optimization methods to decrease runtimes by 99.9%
- Utilized object detection CV models (YOLO, Tensorflow) to track vehicles in satellite imagery data with >98% accuracy

PUMA, Tech Consultant (Contract) *Sep 2023 – Jan 2024*
- Identified how AI (content generation, predictive analytics, etc.) can be incorporated into PUMA's marketing scheme

Bluebonnet Data, Data Fellow Volunteer *April 2023 – Jul 2023*
- Data analysis for progressive campaigns, conducted analysis using R, Python, ArcGIS, SQL for data on 60,000+ voters

Airbnb, Tech Consultant (Contract) *Feb 2023 – April 2023*
- Researched artificial intelligence techniques to combat deepfakes, social engineering, and other hacking methods

Cardiac Vision Laboratory at UCSF, Machine Learning Research Apprentice *Sep 2022 – Aug 2023*
- Designed novel deep learning architectures to remove illumination/motion artifacts from optical imaging of heart tissues
- Utilized variety of computer vision techniques to create synthetic video data and build PWC-Net (CNN) pipeline

HHMI Janelia Research Campus Funke Lab, Laboratory Assistant/Intern *May 2020 – Jul 2022*
- Designed, implemented, and tested a machine learning system for protein identification in electron microscopy images
- Created computer vision simulations to render marker proteins in fly brain data, created training pipeline for U-Net
- Visualized key metrics (distance, density, vesicle type) in Python for secondary paper to be published in Nature

TJHSST Computer Systems Senior Research Laboratory, Student Researcher *Aug 2021 – Jun 2022*
- Implemented system to translate eye blinks detected from electroencephalograms to Morse code to English text-to-speech

George Mason University ASSIP, Full Stack Development Research Intern *Jun 2021 – Aug 2021*
- Built mobile app to parse through geospatial environmental data to inform users about water supply/farmland viability
- Worked on server-side and backend in JavaScript, Python, Flask, and ArcGIS (to parse through map data)

US Naval Research Laboratory, Reinforcement Learning Research Intern *Oct 2020 – Dec 2020*
- Researched/implemented reinforcement learning techniques in application to imperfect information gaming for US Navy
- Built multiple bots (using MCTS, Minimax, etc.) to play reconnaissance blind chess, achieved final win rate of above 97%

SKILLS

Languages: Python, Java, JavaScript, HTML, C, C++, Scheme, Swift, RISC-V, SQL **AI/ML:** PyTorch, TensorFlow, OpenCV

Tools: Linux, Git, NumPy, SciPy, Scikit-Learn, Pandas, jQuery, Arduino, Matplotlib, Flask, ArcGIS, MATLAB, JSON, PySpark

Areas of Experience: Object-Oriented Programming, Artificial Intelligence, Computer Vision, Big Data, Data Structures, Neural Networks, Web/Mobile App Dev, Statistical Analysis, Public Speaking, Research, Decking, Image Processing, NLP