

Esha Karlekar

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EDUCATION

University of California, Berkeley

Graduating: May 2025

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

GPA: 3.7/4.0; **Relevant Coursework:** CS61C (Machine Structures), CS61B (Data Structures), CS70 (Discrete Math & Probability), EECS 16A & 16B (Electrical Engineering and Linear Algebra), CS61A (CS Fundamentals and Python)

Thomas Jefferson High School for Science and Technology

GPA: 4.52/4.00; **Relevant Coursework:** Mobile/Web App Development, Machine Learning 1 & 2, Artificial Intelligence 1 & 2, AP Computer Science/Data Structures, AP Statistics, Multivariable Calculus, Linear Algebra, Discrete Math

EXPERIENCE

MITRE, Applied Machine Learning Intern (Transitioned to Part Time Engineer Fall 2023)

May 2023 – Present

- Using generative AI large language models (BART, GPT-J, LLaMA) to summarize and create chatbots to efficiently query government records with optimization methods that decrease runtimes by 99.9%, impacting 3 governmental organizations
- Using object detection CV models (YOLO, Tensorflow) to track vehicles in satellite imagery data with >98% accuracy

Bluebonnet Data, Data Fellow Volunteer

April 2023 – Jul 2023

- Data analysis for progressive campaigns, partner with one campaign/nonprofit for duration of fellowship
- Conduct district and voter analysis using R, Python, ArcGIS, and 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

Valley Consulting Group, Technology Consultant

Feb 2023 – Present

- Berkeley's premiere tech-consulting group; works with Fortune 500's and industry-leading tech companies
- Worked on a capstone project utilizing generative AI (OpenAI's DALL-E) to create a messaging sticker extension

Cardiac Vision Laboratory at UCSF, Machine Learning Research Apprentice

Sep 2022 – Present

- Designing 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
- Rendered marker proteins in existing fly brain data and created training pipeline for U-Net (CNN)
- Visualized key metrics (i.e. distance, density, and vesicle type) using 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
- Conducted stream data processing of audio files from EEG, translated blink data to English, created accessible UI

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 and implemented reinforcement learning techniques in application to imperfect information gaming
- Built multiple bots (using MCTS, Minimax, etc.) to play reconnaissance blind chess, achieved final win rate of above 97%
- Techniques and algorithms to be applied to machine learning tactics by the US Navy

SKILLS

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

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

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

AWARDS/LEADERSHIP

Cal Alumni Association Leadership Award; Fannie Mae College Scholar Award (x2); National Merit Finalist; AP Scholar Award with Distinction; National Speech and Debate Association Academic All American; Captain of TJHSST Congressional Debate Team; President of TJHSST National Spanish Honor Society