Prakhar Sinha

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EDUCATION & SKILLS

University of California, Davis Jul 2020 - Jun 2024
B.S. Computer Science

Relevant Coursework: Data Structures and Algorithms, Discrete Mathematics/Computation Theory, Development in Unix and C++, Abstract Mathematics, Real Analysis, Machine Dependent Programming, Introduction to Quantum Computing, Computer Vision, Computer Architecture, Calculus, Cryptography, Programming Languages, Operating Systems, Algorithm Design

Programming	Python, C++, C, Javascript, Typescript, CSS, GDB, Go, Lisp, Prolog, Embedded Systems (x86, ARM, PIC)
Technologies	PyTorch, React, D3, Socket.io, Flask, Docker, Google Test, OpenCV, Next.js, Git, GNU Make, GDB, Unix

EXPERIENCE/LEADERSHIP

Generative AI Product Engineering Intern June 2024 - Present
VDart Inc. *Remote*

- Deployed Scripta, a product designed to automate early stages of the hiring process using **LLMs** like **Meta Llama 3.1**
- Wrote the entire front-end using **Figma, Next.js, Typescript, Tailwind CSS** and integrated **Firebase** and **AWS services**
- Developed prompt engineering techniques and integrated RAG into the LLM to focus model attention and reduce LLM hallucinations

Computer Vision Specialist/Machine Learning Researcher June 2024 - Present
UC Davis Health (P.I. Farzad Fereidouni) *Sacramento, CA*

- Wrote **image-to-image** translation algorithms to virtually stain live tissue samples using tools like **OpenCV**, **U-Nets** and **PyTorch**
- Optimized slow and inefficient image processing algorithms by over 75% using GPU acceleration through **Cupy** and **NVIDIA Rapids**
- Fine-tuned cutting-edge CV models like **Meta SAM** to develop modern, machine learning driven, image-processing pipelines that made image segmentation masks in ∼1000ms. Integrated pipeline into legacy **Visual Basic .NET** codebases using **C#** and DLLs

Machine Learning Research Assistant March 2023 - December 2023
VIDI Research Lab (P.I. Kwan-Liu Ma) *Davis, CA*

- Studied and developed applications for **attention diversion** and **transformers** in machine learning networks
- Practiced and thoroughly studied **PyTorch, Grad-CAM** and **transformers** for computer vision

PROJECTS

Neuro-Prosthetic EEG Controlled Robotic Arm September 2023 – May 2024
Neurotech@Davis *Project Link*

- Engineered a low-cost neuro-prosthetic that could be controlled through the use of mental imagery in the brain using EEG signals
- Integrated the EEG headset with Python software and developed software to train a machine learning model with EEG data.
- Participated as the project manager as well as the lead software engineer for this project. Wrote multiple **Python** scripts to facilitate communication between the **Arduino** and the Emotiv EEG headset, and designed data pipelines

Machine Learning Data Visualization Web Dev Project July 2023 - August 2023
VIDI Research Lab *Project Link*

- Developed a web app to visualize the 2nd to last layer of the ResNet-50 machine learning network to understand model behavior
- Utilized **React** and **D3** data visualization for front end. Managed communication through **Socket.io** and **JSON**. Leveraged back-end tools like **Flask, Python, PyTorch, NumPy,** and **OpenCV** to process and handle data

Colorizing Greyscale Images with Generative Adversarial Network July 2022
Neuromatch Academy *Project Link*

- Developed a **GAN machine learning** network to recolorize grayscale images that were **90%** accurate to the original image
- Utilized **ResNet-50** as a backbone for the model and developed a novel discriminator to enhance the model's performance by **45-50%**

LEADERSHIP/CLUBS

Head of Projects Division September 2022 – June 2024
Neurotech@Davis *Davis, CA*

- Managed a division of **>100 people**. Facilitated **communication** between different divisions and projects, oversaw the development of all projects, and practiced **leadership** skills. Coordinated responsibilities amongst team members
- Placed **3rd** at the national 2023 NeurotechX BCI competition: *Maximizing Learning Potential: An EEG-based Haptic Feedback BCI Solution for Improving Student Focus.* **2nd** at the California Neurotech Conference: *Neuro-prosthetic EEG controlled Robotic Arm*