

Parth Bhalerao

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EDUCATION

Santa Clara University - Master's in Computer Science and Engineering, **CGPA – 3.7 / 4.0**

Sep-23 to Jun-25, Santa Clara, CA

Ramdeobaba University - Bachelor of Engineering Electronics and Computer Science, **CGPA – 9.4 /10**

Aug-19 to May-23 MH, India

TECHNICAL SKILLS AND COURSEWORK

Programming Languages: Java, Python, C++, SQL, Bash Scripting, HTML/CSS

Tools/Framework: AWS, REST-APIs, Git, PyTorch, NumPy, Pandas, TensorFlow, Java Swing, AWT, Collections, STL, Github.

AI Frameworks: OpenAI-API, GPT-4, Ollama, Llama-index, Deep-Seek-Coder, Bio-GPT, CLIP, LLaVA, Multi-Agent AI Systems.

Selected Coursework: Distributed Systems, Algorithms & Data Structures, Operating Systems, Machine Learning, NLP, Deep Learning, Computer Networks, Software Engineering & Project Management, Database Management Systems, Operating Systems.

PROFILE SUMMARY

As an upcoming graduate from Santa Clara University with several internship experiences, I bring proficiency in **C++, Java, Python, and SQL**. I also have **in-depth knowledge of large language models (LLMs) and other AI frameworks**. With a solid background in **system design, backend development, machine learning, and data analysis**, combined with a **strong foundation in Git**, I am eager to contribute to teams solving complex problems and challenging tasks in **Software Development and Gen-AI**. My previous and ongoing strong research background displays my ability to design workflows for new problem statements, working comfortably in group environments and fast learning ability. With strong communication skills and technical expertise, **I am actively seeking the full-time roles SDE and Gen-AI** and wishing to collaborate on cutting-edge technologies.

Work Experience

Data Analyst – Provost Office, Santa Clara University Jan-2024-Present

1] Worked with complex workday database, having **15000+ records**, and improved the automation process from **2-hrs to 25-mins**, using python and bash scripting.

2] **Developed a model** for personalized student course plans, based on majors and additionally **integrated a CI/CD pipeline** for departments and helped in optimizing and improving the departmental course planning and seat allocation **accuracy from 75% to 95%**.

3] Created interactive web pages for the university using HTML/CSS and the internal Terminal Four tool for web design and hosting at SCU.

Research Assistant – HASO Labs, Santa Clara University, Sep-Dec-2023

1] **Worked with a high-resolution video dataset, with over 300GB**, and wrote the code for automation for generating the vector embeddings by **efficiently leveraging the CPU+GPU resources and enhancing the computational speed from 16hrs to 7.5hrs**.

2] **Explored the CLIP and Google's Media-pipe Library** for processing videos and extracting relevant key-points and vectors for video sign to text prediction.

3] **Handled responsibilities for deploying the designed automation services on AWS and creating APIs**, which were later integrated with the Unity Environment for **building the AR/VR application in the Meta environment**.

Machine Learning Intern – Innovative Technologies, India, Jun-Nov-2022

1] Worked with **collecting the raw dataset from hospitals, by exporting xml records of patients and writing automation scripts for extracting the co-ordinates of the ECG plots and generating the organized dataset**, and this generated a **novel approach for predicting abnormalities in ECG directly from raw co-ordinates**, initially which is done using graph matching.

2] I **applied various EDA and feature engineering techniques to the prepared dataset**, identifying key regions and coordinates in plots that were crucial for predicting abnormalities. Using several standard **machine learning frameworks, this novel approach achieved an accuracy of 83%**, marking a significant step in the process.

3] This work at the end **resulted in the publication of an IEEE Scopus-Indexed research paper**. ([Link to the research Paper](#))

Embedded Systems Intern – ECDS, India, Dec-2021 to Apr-2022

1] Got training on C++ programming and developed a firmware for sensor of arrays in calibrating water level analysis, **which worked in real-time with an accuracy of 92%** and implemented **IOT transfer with minimizing delay up to 5 seconds**.

Selected Projects

([Click here for other projects](#))

Git-Viz – RAG, Llama-index, Flask, AWS, React, Pinecone, LLM

1] **Designed the complete backend**, handling user requests to process **GitHub metadata and return the relationships in Json format to return the relationships and commits to generate the graphs**.

2] OpenAI models were used to generate and store commit-wise **vector embeddings in Pinecone, enabling an integrated RAG system with Llama-index to retrieve top-k matching vectors based on user queries**. Additionally, I wrote robust application logic, and all **Flask API endpoints were created for deployment on AWS**.

3] Additionally, **I developed features to generate summaries of individual commits and the entire repository** by maintaining a series of pointers from the latest commit to the first. By recursively traversing the commit history, embeddings were extracted, and AI-generated summaries were produced using the Deep-seek-Coder LLM.

4] **The project ended up being one of the top 5 in the Llama-index hackathon**, this rag integrated comprehensive codebase visualizer, streamlined **navigation for new team members and assisting senior engineers during onboarding**.

AI-Based System Design Builder – ([GitHub](#)) ([Video-Demo](#)) ([Blogpost](#))

1] This project was built as a part of Nvidia-Hack-AI hackathon, I importantly **contributed in writing the application logic for building complex graphs based on the adjacency matrix** returned by the LLM.

2] Additionally, I also wrote the API endpoint for the backend and contributed in refining the prompts to get accurate systems design architectures, based on user query and thus resulted in **83% accuracy in constructing the system design graphs**.

GraphViz – Algorithmic Simulation – JScript, D3.JS, HTML/CSS

1] Designed a graph algorithm simulation tool, **actively used by 300+ students**, utilizing the D3 library to create a basic UI yet a cleaner visualization by treating graph nodes as magnetic dipoles, preventing overlap in complex graphs. ([Launch Demo](#)) ([GitHub](#))

Research Work

Novel Digital Circuit Decoder for Multi-Lane traffic – ([Link to Paper](#))

Developed a novel traffic sensing system using an array of sensors, decoder logic, and IoT integration, presented at the **IEEE IIT Delhi conference, one of the top 1% universities in India**.

Point of Care Device Vital Parameters – ([Link to Paper](#)) ([Patent Granted](#))

Developed a compact, non-invasive **device for measuring vital signs** like ECG, heart rate, and blood pressure. Created a prototype, analyzed performance. This work is also patented and **secured a granted patent**.