

Vrutik Shah

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EDUCATION

University Of California, San Diego

Master of Science (MS), Electrical and Computer Engineering

Coursework: Deep Generative Models, Visual Learning, ML for Physical Applications, Recommender Systems

San Diego, CA

Mar 2024

Indian Institute of Technology, Gandhinagar

Bachelor of Technology (B.Tech), Computer Science & Electrical Engineering

Coursework: Operating Systems, Data Structures, Algorithms, Computer Vision, Computer Networks

Gandhinagar, India

Jul 2022

INTERSHIPS

Qualcomm Technologies, Inc | Software Engineering Intern

Jun 2023 – Sept 2023

- Created tool to automate comparison of **Graph XML** patchsets in Gerrit, streamlining graph diff visualization
- Integrated the tool into the **Jenkins pipeline**, enabling automatic execution each time a new Gerrit is submitted
- Implemented a cleanup macro, enhancing resource utilization by promptly removing expired files from the filer
- Wrote autogen script for **image metadata dumping** from Abstract Syntax Tree files for the **Camera Driver**

Information Technology Services, UC San Diego | Student Software Developer

Dec 2022 – Jun 2023

- Developed and executed proof of technology for a **data pipeline** monitoring system utilizing **Apache Airflow**
- Established data tracking by implementing sensors across AWS buckets, Oracle Databases, and MS SQL server
- Automated deployment via Python scripting & smooth system transition to production through infrastructure test
- Enhanced reliability with a **Splunk monitoring alert**, generating daily summaries and notifying in case of failures

ITC Limited | Summer Intern - Computer Vision

Jun 2021 - Aug 2021

- Led deployment of intelligent vision systems, resulting in a remarkable **50% reduction in false alarms** raised
- Streamlined operations with a 30% improvement in efficiency through integration of new software components
- Demonstrated cost-effectiveness by redesigning the system for enhanced scalability & annual **saving of \$30,000**

Tata Consultancy Services | Software Engineering Intern

Jun 2020 – Aug 2020

- Engineered a web scraping tool utilizing **TF-IDF algorithm** to produce concise reports, achieving 6x performance
- Transformed the tool into a portable application compatible with Windows and Linux, expanding user accessibility
- Enhanced UX by tailoring the interface, promoting cross-functional use for the Business Analytics team

PROJECTS

EyeQ: Wearable device for assisting the blind and visually impaired | Qualcomm Hack - 2nd Place

Jul 2023

- Led a 5-member team to develop EyeQ, a vision & speech enabled wearable for assistive indoor navigation
- Designed a working prototype with Spatial object memory, Voice-enabled navigation & Automatic fall detection
- Validated viability through on-device deployment, showcasing potential to enhance indoor navigation for the blind

Music Accompaniment Generation with Vocal Tracks | Generative models, Transformers

Jun 2023

- Developed SangGeet, an innovative generative model for creating instrumental music to complement the vocals
- Integrated state-of-the-art Hubert & Transformer models to extract semantic and acoustic sound representations
- Leveraged advancements in neural audio codecs and trained on MUSDB18 dataset, improving model's accuracy

Brain Typing: Deep Feature Learning with EEG Signals | Data preprocessing, Optimization techniques

May 2023

- Implemented a Hybrid CNN-LSTM model for EEG signal classification, achieving 91.1% test accuracy
- Processed and normalized EEG data, selecting 14 channels optimized for Motor Imagery (MI) intent signals
- Conducted parameter tuning outperforming a CNN-only accuracy of 34.62% & an RNN-only accuracy of 68.90%

Visual-Inertial SLAM On A Moving Vehicle | Inertial Sensors, Path and Motion planning, Mapping

Feb 2023

- Collected data from IMU sensor & visual features from a stereo camera fitted on a car moving in San Diego
- Synchronized measurements from sensors and generated trajectory of the motion using Localization
- Implemented Simultaneous Localization and Mapping using an Extended Kalman Filter (EKF)

SKILLS

Programming Languages: Python, C/C++, MATLAB

Libraries & Frameworks: PyTorch, Docker, Git, Numpy, Pandas, Gerrit, Apache Airflow, Splunk, Jenkins Pipeline

Skills: Software Development, Deep Learning, Automation, EDA, Data Pipeline, Computer Vision, NLP