

EDUCATION

Master of Science, Electrical and Computer Engineering, Carnegie Mellon University
Bachelor of Technology, Instrumentation and Control Engineering, NIT Trichy, India

Dec 2022
Aug 2015

SKILLS AND RELEVANT COURSES

Languages Python, C/C++, Embedded C, Java
Packages Scikit Learn, Pandas, Numpy, Scipy, Pytorch, Tensorflow, Keras, OpenCV, Matplotlib, Seaborn, Keil μ Vision
Courses(CMU) Computer Systems, Deep Learning, Machine Learning for Signal Processing, Computer Vision, Distributed Systems

PROJECTS

Augmented Reality Application and Panoramas (Computer Vision Project) CMU — Oct 2021

- Created an augmented reality projection of the Kungfu Panda movie onto a notebook and stitched images to create Panoramas.
- Built functions using Numpy to extract important features from an image using the FAST detector algorithm and described these images using BRIEF descriptor algorithm. Used these features and descriptors to calculate homographies using RANSAC and warped the frames of Kungfu Panda movie video onto a notebook.
- Achieved a frame rate of 26.5 FPS which is suitable to run the application real-time.

Face detection, Identification and Verification. (Deep Learning and Machine Learning Project) CMU — Mar 2021

- Used Adaboost to detect faces in an image, CNN models to identify and verify faces in an image.
- Employed PCA and ICA on training data to extract the important faces from an image. Used these features to train 200 weak threshold classifiers based on the Adaboost technique to detect whether a face is present in the image.
- Designed and trained Convolutional Neural Network (CNNs) based resNet34 architecture to extract and represent important facial features of people and perform multi-class classification (4000 classes) useful for face
- Achieved an accuracy close to 98% for face detection, 94% for face verification and 86% for face identification which is close to SOTA for resNET34 architecture

3D Reconstruction using triangulation (Computer Vision Project) CMU — Nov 2021

- Reconstructed a 3D point cloud from a pair of images of a temple taken at different angles.
- Implemented the 8-point algorithm seen in class to estimate the fundamental matrix from corresponding points in two images. The essential matrix is computed from the fundamental matrix and calibrated intrinsics compute the essential matrix. The essential matrix can then be used to compute a 3D metric reconstruction from 2D correspondences using triangulation.
- Successfully created a 3D point cloud version of a temple with more than 80% inliers in RANSAC

Cross-domain financial Sentiment Analysis using Unsupervised Self-training (NLP Project) CMU — Sep 2021

- Overcame the limitations of training data size using unsupervised self-training algorithm and analyzed the impact of twitter sentiment on overall financial sentiment.
- Pretrained FinBERT, RoBERTa, BERT models on twitter data and further tuned them on highly nuanced financial data using unsupervised self-training algorithm and analyzed their performance.
- Achieved an accuracy within 3% of the SOTA FinBERT model. The model can be used on specialized data with few training samples.

Transcribing, Recomposing music using KLT and Linear Style Transfer (Machine Learning on Audio Signals) CMU — Sep 2021

- Transcribed and Recomposed a musical song, 'Misirlou', on the Byzantine scale with only 7 prominent notes using Karhunen Loeve Transform/Principal component analysis and gradient descent
- Created Piano version of the song 'BlindingLights' from its Synth version through linear Style Transfer. Achieved an SSD error of 0.018 between the original song and recomposed song

RELEVANT EXPERIENCE

Assistant Manager(Technology and Development)

Aug 2016 — Aug 2021

Indian Oil Corporation Limited

Paradip, Orissa

- PLC based automation system powered by RFID sensors for loading of LPG trucks:- RFID tags are used to detect the entry/exit of vehicle. Once the vehicle is detected with the help of RFID tag, the Preset of the vehicle is set by communicating with SAP. The PLC then coordinates with the batch controller via TCP/IP protocol and loads appropriate quantity of liquid LPG into the truck.
- Handled Project for the development of AI based tracer cameras that identify head count of individuals present inside a building in the event of a potential fire hazard.
- Managed a group of 10 employees working in three teams - Embedded software maintenance, ML/AI development in LPG Plants, Supply and Distribution. Received outstanding employee award for the year 2019-20.