# SAI PRAHLADH PADMANABHAN

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## EDUCATION

**Carnegie Mellon University,** Pittsburgh, PA — May 2021
**Master of Science in Electrical and Computer Engineering** — GPA: 3.77/4.00

**Vivekanand Education Society's Institute of Technology,** Mumbai, India — May 2019
**Bachelor of Engineering in Electronics** — GPA: 9.06/10.00

## GRADUATE COURSEWORK

Introduction to Deep Learning (11-785), Machine Learning with Large Datasets (10-605), Foundations of Privacy (18-734), Computer Vision (16-720), Estimation Detection and Learning (18-752), Rapid Prototyping (18-745)

## SKILLS

**Programming languages:** Python (Proficient), C++ (Beginner)
**Application Software:** MATLAB, Databricks PySpark, AWS, Jupyter Notebooks
**Machine Learning Libraries & Frameworks:** PyTorch, Tensorflow, Scikit-learn, Numpy, Pandas, OpenCV, Matplotlib

## PROFESSIONAL EXPERIENCE

**Engineer –** *Samsung Semiconductor, San Jose, CA* — September 2021 - present

- Developed a Verilog code generation assistant with a chat-based UI using various code-gen LLMs, with the best performing model achieving 80% pass@5 success in Verilog code generation, benchmarked with VerilogEval, enhancing user interaction and development efficiency.
- Designed a movie recommendation demo for DLRM inference utilizing Memory Semantic SSD and showcased the same in the Open Compute Project conference.
- Established a Jenkins pipeline to automate performance testing and built a Grafana dashboard for data visualization, accelerating the testing process by 10% and enhancing monitoring efficiency.

## RESEARCH EXPERIENCE

**Graduate Research Project** — February 2021 - May 2021

- Designed a dense neural network to classify reaction time of drivers with a test accuracy of 83%.
- Applied transfer learning and boosted network performance from 46% to 78% on unseen driver data.

**Graduate Research Assistant -** *CyLab, CMU, Pittsburgh, PA* — September 2020 - December 2020

- Performed K-means clustering on driver reaction time classification output of a neural network to verify robustness of classification and ensure safety of shared control in autonomous driving.
- Improved the clustering methodology through mean centroid initialization and elbow method to observe a maximum of 20% increase in cluster radii across 5 clustered regions.

## ACADEMIC PROJECTS

**Attention Based End to End Speech to Text Deep Neural Network** — November 2020 - December 2020

- Implemented a speech to text transcription network as outlined in the paper Listen Attend and Spell. Network design involved an Encoder and Decoder structure composed of Pyramidal Bi-LSTM and attention mechanism.
- Achieved an average Levenshtein score of 24.3 on Librispeech dataset using teacher forcing and weight tying techniques.

**Defense against Adversarial Attacks** — September 2020 - December 2020

- Formulated FGSM and PGD attacks on CIFAR-10 dataset with ResNet-32 backbone, collaborating with a team of 4 members.
- Developed the inpainting algorithm, second stage of a 3-stage defense pipeline involving image cutout, image inpainting and denoising using autoencoders, obtaining a 70.5% classification accuracy for 0.05 epsilon on FGSM attacks.

**MyTorch Deep Learning Framework (11-785 coursework)** — September 2020 - November 2020

- Built a custom Deep Learning library analogous to PyTorch, having auto differentiation feature, supporting forward and backward propagation operations for dense layers, 1-D Convolutions, LSTMs and GRUs.

**Face Classification and Verification Using CNNs** — September 2020 - October 2020

- Trained a ResNet-18 CNN model to acquire face embeddings of images and get Cosine Similarity between two images to verify if it is of the same person and achieved an AUC Similarity score of 93.45%.

## ADDITIONAL EXPERIENCE

**Graduate Teaching Assistant, Introduction to Deep learning -** *CMU, Pittsburgh, PA* — December 2020 - May 2021