SHIKHAR GUPTA He/Him/His

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EDUCATION

MS, ECE | Machine Learning Track *GPA 4.00*
University of Michigan - Ann Arbor *Jan 2021 - May 2022***
Courses: Machine Learning, Computer Vision, Probability and Random Processes, Matrix Methods in Signal Processing and Machine Learning, Self Driving Cars, ML and DS Design Lab*, Optimization for Machine Learning*
** Ongoing Courses, ** Expected date of graduation*

BTech, Electronics and Communication Engineering
Indian Institute of Technology, Guwahati *Aug 2013 - Jun 2017*

EXPERIENCE

Software Engineer II, *Cisco, Bangalore* *Aug 2017 – Dec 2020*
- Designed and implemented multiple features for Catalyst 9k switches/routers.
- Strong **C programming**, testing and debugging background.
- Improved the code coverage from 65% to 80% (3200+ LOC's) by writing exhaustive unit tests in **Python**.
- Handled 50+ issues encountered during testing phase and in customer's networks.

Graduate Student Researcher, *University of Michigan* *Sept 2021 – Present*
- Working on **robust outliers detection** for Computer Vision based applications.
- Designing and implementing an **alternating-minimization based algorithm** to efficiently eliminate outliers from input sensor data without any prior knowledge of noise distribution or threshold.
- The algorithm will be tested against these applications - Point Cloud Registration, Mesh Registration and SLAM.

PUBLICATIONS

(Extended Abstract) ***G. Shikhar**, *L. UngHee, *F. Jamie and *D. Naren **"Preference-Based Reinforcement Learning"**. *poster presentation at 2021 Eastern European Machine Learning (EEML) Summer School*

***G. Shikhar**, *V. Arpan, T. Gaurav **"FPGA Implementation of Spiking Neural Networks"**. *2020 27th IEEE International Conference on Electronics, Circuits and Systems (ICECS)*
** Equal Contribution*

PROJECTS

Image Colorization Web Application *Skills: **AWS, PyTorch, ONNX, Lambda, S3***
Currently developing a web application to colorize grayscale images. The inference will be done using a deep learning model hosted on **AWS**. The application itself will be hosted on **Heroku**.

Preference Based Reinforcement Learning *Skills: **Tensorflow, Python, RL***
Explored how the reward function can be modelled using preferences from humans by showing them clips from the episode runs of an RL agent. Used Gaussian Process to learn the reward function.

Driving In The Matrix *Skills: **PyTorch, Python***
As part of a self-driving car competition, implemented a **Faster-RCNN based detection** pipeline trained on data from simulation (GTA V). Used off-the-shelf deep learning model to detect cars in images.

DeBlur Generative Adversarial Network *Skills: **PyTorch, Python***
Evaluated the trade off between the complexity of the generator network of DeBlur GAN and its PSNR. **Reduced the training time by 50%** by experimenting with the number of ResNet blocks in the architecture.

House Pricing - Advanced Regression Techniques (Kaggle) *Skills: **Python, Regression, Seaborn***
Visualised and pre-processed the famous Ames Housing dataset. Applied regression techniques to predict house prices. Ended up in **top 10% of the leaderboard**.

Spiking Neural Network *Skills: **Python***
Developed a Python library for Spiking Neural Network with simplified equations. Designed an asynchronous hardware accelerator for the library and implemented it on FPGA. The Python library has **650+ stars and 200+ forks on Github**.

SKILLS

Languages: Python, Julia, C, C++, MATLAB
Tools: VS Code, Tensorflow, PyTorch, Jupyter Notebook