

SHREYA KADAMBI

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SUMMARY

I work at Petuum as a **Machine Learning (ML) engineer** specializing in computer vision. I have over 5 years of combined experience in ML (1.5 yrs) and signal processing (4 yrs). Recently, I have focused on building and deploying **deep learning models for X-rays and CT images** to assist diagnostic radiology as well as a short stint with **time series predictive models**.

On the engineering front, I worked for product release of *Intel XMM7260, XMM7360 modems* where I was fully involved in **3G physical layer systems software development** life cycle.

Research Interests: unsupervised learning, privacy preserving ML, adversarial examples, interpretable deep learning

EDUCATION

New York University

Master of Science in Electrical Engineering, advised by Prof. Anna Choromanska Aug 2016 - May 2018

Coursework: Advanced Machine Learning, Inference and Representation Learning, Data Structures and Algorithms, Probability and Stochastic Processes, Advanced Signal Processing

Indian Institute of Technology, Madras

Master of Technology in Electrical Engineering (*specialized in Signal Processing*) Aug 2010 - May 2012

EXPERIENCE

Petuum, Applied Machine Learning Engineer

September 2018 - Present

Applied ML for Healthcare

Pittsburgh, PA

- Built and shipped prototype ML models for *multi-label disease classification, multi-task learning, transfer learning* tasks for healthcare domain. Implemented static quantization to deploy lighter networks.
- Applied deep learning methods such as *GCN's, Tree CNN* and *Ensemble* techniques to incorporate domain knowledge. Exploited structural information in data to improve the overall AUC by 3% for 17 diseases.
- Built and deployed an end to end ML pipeline of modular processors for multi view datasets for model development, model quantization and automation of ML experiments.
- Defined *consistent evaluation metrics* for the clinical workflow in collaboration with healthcare experts.

Nvidia, Deep Learning Intern

Feb 2018 - May 2018

Autonomous Driving Group, Host: Dr. Urs Mueller (Eng Director)

Holmdel, NJ

- Implemented bootstrapping technique to statistically aggregate data during training. This approach filtered a data cache containing *out of distribution-* and *noisy data* at the end of training process.
- Worked with perspective transformed video data to develop and test regression based trajectory prediction models.

Intel Corporation, DSP & Firmware Engineer

Aug 2012 - Aug 2016

3G PHY Layer Team

Bangalore, India

- Developed and deployed signal processing algorithms for interference cancellation module on Tensilica DSP core.
- Owned and maintained the 3G scheduler module for physical layer. Developed feature enhancements and tested on live networks for XMM7260 and XMM7360 wireless product release.

PUBLICATIONS

WGAN Domain Adaptation for the Joint Optic Disc-and-Cup Segmentation in Fundus Images,

Shreya Kadambi, Zeya Wang, Eric P. Xing, International Journal of Computer Assisted Radiology and Surgery (IJCARS 2020) & 11th International Conf. on Information Processing in Computer-Assisted Interventions (IPCAI 2020)

SKILLS

Programming Languages: Python, C, R, VHDL, Verilog

Frameworks: PyTorch, TensorFlow, Matlab, Numpy, Scikit-learn, Opencv

DL Techniques: Segmentation, Object detection, Network Quantization, Multi-Task Learning

RESEARCH WORK

- **Domain Adaptation on Medical Data sets:** Developed a *WGAN* based adversarial domain adaptation framework to improve generalization capabilities of a segmentation model for retinal images. Implemented a novel patch discriminator leading to an improvement of Jaccard Index by 5% over the widely-used transfer learning approach.
- **Adversarial Training Sample Size Minimization (Thesis):** Compared various empirical approaches to identify different sub-spaces in training domain most susceptible to adversarial attacks in order to build robust generalized models. Achieved a detection accuracy of 90% on the CIFAR dataset.

PROJECTS

- **Nash Propagation for Loopy Graphical Games:** Implemented a *modified loopy belief propagation* in reduced search space in order to compute Nash equilibrium of non-cooperative multiplayer games.
- **Cognitive Visualizations using Hoeffding's Inequality:** Formulated a risk evaluation method using Hoeffding's Inequality that was less sensitive to underlying noise. Built a real time visualisation tool to predict confidence of Return on Investment (ROI). This work was demonstrated at a research expo held at *NYU Abu Dhabi*.