Prateeth Nayak

(+1) 612-889-0197 | prateethvnayak@gmail.com | prateethvnayak.github.io/welcome/ | prateethvnayak | prateethvnayak

"Make the change that you want to see in the world."

Education

University of Minnesota — *Twin Cities, USA*

Masters in Electrical and Computer Engineering — *Aug. 2017 - Dec. 2019*

- Prof. Mingyi Hong Research Group; GPA 3.7/4.0

Visvesvaraya Technological University — *Belgaum, IND*

Bachelors in Electronics and Communication Engineering — *Aug. 2013 - Jun. 2017*

- Graduated *Summa Cum Laude*; GPA 4.0/4.0

Research Interests

Applied Machine learning, Computer Vision, Model Quantization/Pruning, On-device ML, Deep Learning Optimization

Skills

Programming Python (proficient), C/C++ (basic), MATLAB, SQL, Bash, R, SWIFT, LaTeX
Frameworks Tensorflow (proficient), Pytorch (proficient), Keras, pytorch-lightning, CUDA, git, docker, OPENCV, iOS-Metal

Experience

Stanford Research Institute (S.R.I.) International — *San Diego, CA*

Computer Scientist, Artificial Intelligence Group — *Feb. 2020 - Present*

- Main constributions in cross-disciplinary DARPA accelerated molecular discovery (AMD) program [Paper]
- Research and framework development for new paradigm of NN learning through logic rules on prior Knowledge [DASL]
- Collaborative research constributions with SRI vision group on Multi-Modal, Zero-Shot Learning [Paper]
- Research directions - *Logic with NNs; Unsupervised Learning; Efficient encoding spaces for representations*

Publications

Conference/Workshops

Transformer based molecule encoding for property prediction [Paper]
***Prateeth Nayak**, Andrew Silberfarb, Ran Chen, Tulay M., John Byrnes* — *Dec. 2020*
Machine Learning for Molecules @ NeurIPs 2020

Bit Efficient Quantization for Deep Neural Networks [Paper][Poster]
***Prateeth Nayak**, David Zhang, Sek Chai* — *Dec. 2019*
Energy Efficient Machine Learning & Cognitive Computing @ NeurIPs 2019

Manuscripts/Preprints

Zero-Shot Learning with Knowledge Enhanced Visual Semantic Embeddings[Paper]
*Karan Sikka, Jihua Huang, Andrew Silberfarb, **Prateeth Nayak**, Luke Rohrer, Pritish Sahu, John Byrnes, Ajay Divakaran, Richard Rohwer* — *Nov. 2020*
*arXiv: 2011.10889; **Under Review***

Internships

Stanford Research Institute (S.R.I.) International — *Princeton, NJ*

Deep Learning Optimization Research Intern, Vision Group — *Feb. 2019 - Aug. 2019*

- Algorithm and system design for low-bit precision inference engine.
- Built a framework for post-training and quantization-aware training of NNs.
- Participated in the MicroNet Challenge at NeurIPs 2019.
- Involved in successful SRI spin-off [LatentAI] catering to Model Quantization/Pruning and NN-Throttling using RL.

Boston Scientific Corp. — *Arden Hills, MN*

Machine Learning Research Intern — *May 2018 - Aug. 2018*

- Developed end-to-end machine learning pipelines for analyzing time-series data obtained from wearable devices.
- Built pain-score prediction models to correlate the pysiological signals of Chronic pain in patients.

AIndra Systems — *Bangalore, IND*

Engineering Intern — *Feb. 2017 - Jun. 2017*

- Worked closely with R&D team on building components of a detection pipeline for cervical cancer cells.
- Evaluating and benchmarking novel image segmentation algorithms for alienating the nuclei in high-res pap smear images.

Bharat Heavy Electronics Ltd. (B.H.E.L) — *Bangalore, IND*

Research Intern — *Jun. 2016 - Nov. 2016*

- Integrated the TMS320F2812 Dev board onto a SBC Controller for a Utility Solar Inverter.
- Implementation of touchscreen display for ease of monitoring

Presentation/Invited Talks

Carlson School of Management Brown Bag Series — *Twin Cities*

Invited Speaker — *Sept. 2019*

- Introduced Computer Vision practices and advanced approaches in image detection, segmentation & tracking.

Selected Projects

Learning using Priviledged Information (LUPI) for time series prediction
Implemented a unique learning paradigm SVM+ to time series prediction called 'SVM-plus'. Evaluated on synthetic and real-life datasets.

YOLO-based real-time object detection for damaged roads on mobiled platform
Implemented YOLO object detector on iOS platform in SWIFT for road damage detection with model accuracy of 70 mAP @ 15-20 FPS. Weight-only quantized model also run on the iOS platform.

Parallelizing of Image segmentation algorithm - CHAN-VESE for CUDA-GPU
Accelerated segmentation algorithm via implementing cuda-kernels on GForce GTX 1080 using CUDA-C; achieved 200x speed compared to seralized CPU implementation for large images

Relevant Courses

Aritificial Intelligence, Computational Aspects of Matrix theory, Computer Vision, Data Modeling with R, Machine learning, Nonlinear Optimization, Predictive Learning from Data, Probability & Stochastic processes, Robot Vision, Algos. & Data Structures, Applied Parallel Programming

Professional Responsibilities

Fall 2018	**Grad. Teaching Assisstant**, Univ. of Minnesota for *Linear Control Systems; Prof. Murti S.*	*Twin Cities*
2016-2017	**Cultural-Committee Head**, B.I.T College BLR Core-Committee	*Bangalore*
2016-2017	**Program Coordinator**, Electrical & Comm. Student Association ECSA	*Bangalore*