Searidang Pa

(+617) 764 6897
pa.s@northeastern.edu
Boston, MA

Education

2020–Present **PhD in Computer Science**, *Northeastern University* *GPA – 4.0*,
Advisor: Rajmohan Rajaraman.

2016–2020 **BA in Computer Science and Mathematics**, *Middlebury College*, Phi Beta Kappa GPA – 3.95.

Objectives

To work in an open-minded and inspiring group that tackles challenging and beautiful problems in Machine Learning, Software Engineering, Network Algorithm, or/and Algorithmic Game Theory.

Technical Skills

Languages Python, C/C++, MATLAB, Bash

Frameworks PyTorch, Keras

Selected Course Projects

Fall 2021 **Implementing Raft from Scratch**.

- Working on implementing a highly available and fault-tolerant State Machine Replication System based on Raft protocol from scratch. Aiming to experiment with various low-level designs to obtain low overhead while still providing the fault tolerant guarantee. Codes on Github in C++11.

Fall 2020 **Predicting Full Spectrum of Peptides using Deep Learning**.

- Implemented the paper *Full-Spectrum Prediction of Peptides Tandem Mass Spectra using Deep Neural Network* and experimented with various shallow network designs to see if a deep network is necessary for good performance. Traditional methods are limited to only predicting the intensities of expected ion types. Codes are in Pytorch framework.

Fall 2019 **Multi-Column CNN Crowd Counter**.

- Trained an ensemble of CNN with different configurations and combine them to estimate crowd sizes from various overhead perspectives. Used adaptive Gaussian kernel to adjust perspective distortion when generate the density map for training. Achieved a MAE below 200 in the *ShanghaiTech dataset* where there can be thousands of people in an image. Codes on Github in Pytorch.

Research Experience

Sept 2020 - Aug 2021. **Improved Bounds for Scheduling Flows under Endpoint Capacity Constraints**.

- Motivated by the software-defined networking technology, we worked on a flow scheduling problem, where given a set of capacitated nodes with dynamically reconfigurable topology, an online sequence of requests, with a release time and a demand, needs to be routed between two nodes. We showed a fundamental limitation that without resource augmentation, the best competitive ratio for the maximum response time objective is unbounded. A surprising result we found was that given a little bit of resource augmentation, we obtained algorithms that has good performance guarantee under a variety of constrained settings. Paper to appear in APOCS 2022.

Summer 2019 **Quantum Algorithm Research**, *Shelby Kimmel's Lab*.

- Worked on a modified Quantum Period Finding problem where there are random insertions or deletions (glitches) of points in the periodic function, a subroutine in the famous polynomial time quantum factoring algorithm. Developed a robust and efficient algorithm to deal with the glitches, and proved performance guarantee for the simple case of a few glitches, and wrote a numerical simulation to test out the predictions of our algorithm and analysis. Link to poster.

Selected Courses

Graduate *Machine Learning*, *Advanced Algorithm*, *Distributed System*

Undergraduate *System Programming*, *Advanced Probability*, *Spatial Agent-Based Modeling* *Computer Security*