

Keerthana Gurushankar

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EDUCATION

Carnegie Mellon University

PhD Student, Computer Science

Aug 2022 – Present

Research focus: *AI Algorithm design for socio-technical systems*

B.S., M.S., Mathematics, QPA: 3.80

Aug 2017 – May 2021

WORK EXPERIENCE

- **Machine Learning Intern, CapSen Robotics** May 2023 - Aug 2023
Computer Vision/Machine Learning models and software for robotics applications
 - Built and tuned segmentation-based ML models for detecting known objects in 3D images for robot applications
 - Contributed performance improvements to production-level project, reducing failure rate from 1/1000 to 1/3000
 - Designed & developed new calibration method, eliminating hardware changes & reducing calibration time 6-fold
- **Research Programmer, CMU** May 2022 – Aug 2022
Optimized Quantum Compilation
 - Developed practical implementation of well-known theoretically correct algorithm for quantum circuit synthesis
 - Contributed parallelized linear algebraic back-end; used parallel data structures & optimization heuristics for speed
 - Achieved 10-fold speed up on base algorithm, while producing shorter optimized circuits
- **Research Associate, CMU** May 2021 – May 2022
Neural modeling with Information theoretic decompositions
 - Performed research projects modeling neural data with information theory, leading to publication in top conference
 - Deduced tractability results using probability, linear algebra, algorithmic methods & data visualization
 - Collaborated with and presented work to researchers of diverse technical backgrounds

PROJECTS

- **Deep Learning Library Implementations** Aug 2022 – Dec 2022
 - Built a complete deep learning library from scratch, with basic implementations of PyTorch and Numpy
 - Wrote efficient CPU/GPU backends using C++/CUDA, autodiff support, modules for optimizers & data loaders
- **Statistical Detector for Cortical Spreading Depressions** Aug 2018 – Apr 2019
 - Designed & implemented (in MATLAB) a statistical detector for anomalous brain waves using ECoG data
 - Modeled & tested Maximum Likelihood Detection, to automate work currently done by expert inspection

SKILLS

Programming Languages: Python, C/C++, SML, MATLAB/Mathematica

SELECTED COURSEWORK

Graduate Artificial Intelligence

Deep Learning Systems

Performance Modelling

Game Theory

Automated Reasoning

Programming Languages

Probability & Computing

Coding Theory

HONORS/AWARDS

2022 Irwin Mark Jacobs & Joan Klein Jacobs Presidential Fellowship - presented prestigious fellowship/funding at MIT

2019 D. E. Shaw Discovery Fellowship - top 30 from over 200 applicants to attend prestigious fellowship programme

2019 CMU Quantathon - member of winning team solving quantitative finance problem in university-wide competition

2018 Putnam Competition - ranked in top 500 nationally

2017 International Physics Olympiad Selection Camp - top 35 students in Physics nationally

2017 NIOS Senior Secondary Board Examination - Highest score among 300,000 students