

KARTHIK GARIMELLA

kvgarimella AT gmail.com ◇ <https://github.com/kvgarimella>

EDUCATION

Washington University in St. Louis

Aug 2018 - Present

Master of Science in Computer Engineering (expected May 2020)

Hendrix College, Conway AR

Aug 2013 - May 2017

Bachelor of Arts in Physics (major) and Computer Science (minor)

GPA: 3.97, *summa cum laude*

RESEARCH

Energy Efficiency Optimization in Multi/Many-core Systems

MSc Thesis: Advised by Dr. Xuan 'Silvia' Zhang

Aug 2019 - Present

- Examining both offline and online methods to create a policy mapping the state of a many/multi-core system (through hardware counters, etc) to a voltage/frequency value of each core while remaining within an allocated energy budget
- Building a pipeline within the SNIPER simulator environment to evaluate the efficacy of various RL methods using the SPLASH-2 and PARSEC benchmarks

Adversarial Machine Learning in Autonomous Vehicles

Drs. Yevgeniy Vorobeychik, Xuan Zhang, Ayan Chakrabarti, Chris Gill

Jan 2019 - Present

- Discovered physically realizable attacks on end-to-end imitation learning agents within the CARLA simulator at both intersections and curved roads which caused the agent to incur infractions
- Built an automated testing environment to sweep the attack space efficiently using Bayesian optimization (grid search would take on the order of years)
- [Github repository](#) and [arXiv preprint](#)

PROJECTS

CARLA 2019 Autonomous Driving Challenge

Drs. Yevgeniy Vorobeychik, Xuan Zhang, Ayan Chakrabarti, Chris Gill

April 2019 - July 2019

- Built an ensemble self-driving agent for the CARLA AD challenge whose inputs were front-facing camera image, high level command, and current speed to predict steering angle, throttle, and brake
- Placed [top three in the challenge](#) and invited to **CVPR 2019** to present our agent

Multi-Agent Pacman: Depth-Limited Expectimax

CSE 511A: Introduction to Artificial Intelligence

Fall 2018

- Developed an evaluation function for the state of a Pacman game with active Ghost agents. Evaluated the state using distance to food pellets, distance to all ghosts, and number of scared ghosts (plus time remaining in scared state)
- Placed 3/125 students in a competition to build a robust evaluation function of Pacman states

WORK

NASA Jet Propulsion Laboratory - Pasadena, CA

May 2019 - Aug 2019

Summer Intern

- Implemented an Elastic stack for the Physical Oceanography Distributed Active Archive Center (DAAC) within Docker containers for portability

- Developed in-house analysis of log distribution metrics to predict data pattern usage across users and datasets

Oak Ridge National Laboratory - Oak Ridge, TN

Sep 2017 - May 2018

Post Bachelor Research Associate

- Re-implemented and optimized the [Daymet Single Pixel Tool](#) using Python's netcdf-4 package to reduce overhead of data retrieval.
- Produced data visualization tutorials and demonstrations for the DAAC. (work can be seen here: <https://github.com/ornl daac/daymet-normals-anomalies-tiles>)

NASA Goddard Space Flight Center - Greenbelt, MD

May 2017 - Aug 2017

Summer Intern

- Built annotated Jupyter Notebooks from the Goddard Earth Sciences Data and Information Services Center (GES DISC) DAAC to demonstrate analysis of satellite data
- Containerized the Jupyter Notebooks using Docker, and deployed Docker container using Google Cloud Platform. (work can be seen here: http://github.com/karthenjamin/data_recipes)

National Radio Astronomy Observatory - Socorro, NM

May 2016 - Aug 2016

REU: Summer Intern

- Implemented detection algorithms for excising Radio Frequency Interference (RFI) from the Very Large Array Telescope by locating RFI using gradients, localized statistics, and radial-fitting algorithms
- Incorporated these algorithms into the Common Astronomy Software Applications (CASA)

TEACHING

Engineering Undergraduate Student Services Tutor

Jan 2019 - May 2019

Introduction to Machine Learning (Washington University)

- Assisted students in learning VC theory, bias-variance tradeoff, generalization, and overfitting

General Physics Teaching Assistant

Aug 2015 - Dec 2016

General Physics I and II (Hendrix College)

- TA for students learning general physics in a workshop/lab environment. Assisted students with the physics problem of the day, discussed concepts of physics, and helped students write code for simulating physics experiments (python). Wrote the solutions and graded the assigned homework

SKILLS

languages	Python, bash, working knowledge of C++/C, x86-64 assembly, R, Java, Rust, Haskell
packages	numpy, pytorch, tensorflow, keras, matplotlib, cv2, sklearn

HONORS

Barry M. Goldwater Scholarship - Honorable Mention 2016

Captain of Hendrix Tennis Team (All-Tournament, All-Sportsmanship Team Honors, ITA Scholar)

Recipient of the Arkansas Governors Distinguished Scholarship

Richard Rolleigh Undergraduate Research Award 2017

Member of Phi Beta Kappa (Arkansas Chapter)

Society of Physics Students Outstanding Presentation Award 2017

Honorable Mention in Mathematical Contest in Modeling 2016 (top 25% international)

Joe G. Robbins Physics Award for Outstanding Students 2015