

Arvind Ramaswami

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Interests: Combinatorial optimization, machine learning

Education

Georgia Tech (Fall 2017 - Fall 2020): BS Computer Science. (Threads: Intelligence and Theory.

Cumulative GPA: 3.82)

Georgia Tech (Expected Spring 2021 - Fall 2022): MS in Computer Science (Machine Learning,

Cumulative GPA: 3.36)

Relevant Coursework:

Math Classes: Advanced Graph Theory, Graduate Probability I, Analysis I, Abstract Algebra I, Algebraic Topology I

CS Classes: Machine Learning Theory, High-Performance Computing, Graphical Models in Machine Learning, Deep Learning, Robot Intelligence: Planning, Applied Cryptography, Intro to Database Systems

Research

Theoretical ML Research - Advisor: Jacob Abernethy

Sept 2019 – Present

Evaluated the effectiveness of different optimization algorithms such as Mirror Prox in the adversarial learning problem. Wrote an undergraduate thesis *Minimax Perspective of Adversarial Examples* in Spring 2020. Currently working with a group to develop adversarial robustness algorithms using multiclass boosting.

ML Research - Advisor: Sebastian Pokutta

Jan 2018 – May 2019

Engineered adversarial attacks on random forest classifiers and developed methods to make them more robust. Performed this research as a member of the Interactive Optimization and Learning (IOL) Lab.

Other research-related work:

SDPs for MaxCut Approximations (April 2021, [Survey](#), [Presentation](#)) -- Wrote a survey (for the Advanced Graph Theory class) about results related to using semidefinite programming to approximate the largest bipartite subgraph, which is an NP-hard problem to compute exactly.

Skills

Programming languages: C++, Python, Java, Javascript

Competitive programming: Qualified for Round 3 of Google Code Jam (2021), ACM ICPC Participant (2021: Rank 3 in Southeast USA region, qualified for the North America Championship).

Work Experience

Amazon - Software Development Engineer (SDE) Intern

May 2020 – Aug 2020

Designed a recommender system that matches advertisers to partners for AAPN (Amazon Advertiser Partner Network). Also performed cluster analysis on the advertiser data.

Lawrence Livermore National Laboratory - Software Engineer Intern

May 2019 – Aug 2019

Developed a testing framework for the calculations to set up experiments at the National Ignition Facility (NIF), the largest laser facility in the world. Proposed data science techniques to validate the calculations.

Leadership

Georgia Tech Programming Team - (Vice President from Fall 2020 to present)

Aug 2017 – Present

Prepares content for weekly meetings in topics such as dynamic programming, data structures, and combinatorial optimization. Arranges practices for ACM ICPC.

Big-O Theory Club - (President from Fall 2020 - Spring 2021)

Aug 2017 – May 2021

Gave talks about theoretical computer science (examples of topics discussed: randomized algorithms, flows) and invited other students to give talks about their research.

Projects

ReconBlind Multi-Chess Agent

Nov 2020

Worked on a team (for the class *Robot Intelligence: Planning*) to create an agent that would play [Reconchess](#). Based our agent on the [AlphaGo Zero paper by David Silver](#) and incorporated a policy neural network with Monte-Carlo Tree Search.

DonationTracker

Aug 2018 - Dec 2018

Created an Android application in a team of five that allows people in need in Atlanta to locate places to get aid and receive donations. Used SQLite to persist profile information and wrote extensive JUnit tests.

WeLocate

Oct 2017

Built a website that uses Yelp's API and AWS Machine Learning to find where to open their business. Received first-place awards at VandyHacks for the Most Disruptive Hack and the Best Financial Hack.

Miscellaneous

Math Contests: Represented Georgia for the American Regions Mathematics League (ARML) in 2015 and 2017, qualifier for American Invitational Mathematics Exam (AIME) in 2017.

Violin: Previously a member of the Atlanta Symphony Youth Orchestra, Georgia All-State Orchestra. Currently playing in the Georgia Tech Symphony Orchestra. Also learned conducting under Dr. Chaowen Ting.

Spoken Languages: English, Spanish, Tamil, Chinese.