

# Arvind Ramaswami

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Interests: Combinatorial optimization, machine learning

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## Education

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

Cumulative GPA: 3.87)

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

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## Relevant Coursework:

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

**CS Classes:** Machine Learning Theory, Deep Learning, Robot Intelligence: Planning, Applied Cryptography, Intro to Database Systems

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## 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.

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## Skills

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

**Competitive programming:** Qualified for Round 3 of Google Code Jam (2021), ACM ICPC Participant (2020: **4th** place team out of ~80 teams in the Southeast USA Region, qualified for the North American Division Championship and received **11th** place in the South USA division)

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## 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.

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## Other Experience

**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

## **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.

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### 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.

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### Honors

**Mathematics:** Represented Georgia for the American Regions Mathematics League (ARML) in 2015 and 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.