

# Aayush Gupta

410 Memorial Drive: 432D, Cambridge, MA 02139

## EDUCATION



MIT

Class of 2021, 5.0 GPA  
Computer Science Major



Saratoga High School

Class of 2018  
High Honors

## CONFERENCE PAPERS

### A Decision-theoretic Approach to Detection-based Target Search with a Drone (2017) ([arXiv](#))

**Accepted** at 2017 IEEE/RSJ International Conf. on Intelligent Robots and Systems (IROS)  
Improved rescue finding time by 3.3x compared to heuristics with reinforcement learning, modeled as a partially observable Markov decision process.  
Used Julia, SARSOP, and Python to build and test on custom built drone. Led team of 3.

### Dynamic Pricing via Reinforcement Learning for Multi-Objective Ridesharing Optimization (2017)

**Accepted** to BayLearn 2017  
Showed 12% profit increase by optimally lengthening average wait time by only 2.3%.  
Used Julia, SARSOP, and Python with reinforcement learning to produce a Pareto curve to reduce passenger wait time while maximizing company profit.

### Self-attention for Graph Neural Networks

Replaced standard message passing steps with query-key-value attention from NLP  
Predicted computational chemistry properties on QM9 dataset

## WORK EXPERIENCE

### Scale AI Intern (2019)

Used Node.js, React, MongoDB, SQL, Python for connected component detection of labelers to construct 95% confidence intervals on bounding box labels  
Decreased labeling errors by 8% for remote LIDAR quality assurance by altering bonus incentives with Typescript

### Securiti.ai Winter Intern (2019)

Implemented custom dilated convolutional neural networks for natural language processing applications with Google Colab and Pytorch.

### Auto-LaTeX Equations Founder (2015-19)

**Over 100,000 weekly users , 4.0+ star rating.**  
Coded and branded own Google Docs add-on for LaTeX equations  
Marketed to professors and admins with cold emails to adopt for education

### Hack Lodge Organizer and Developer (2019)

Led team of 5 to build webapp with React and Node.js to gamify training unlabeled data through public cookie clicker type AI-based classification

### Synthesizing CT images from MRIs with GANs (2017)

*1st Place 2018 Synopsys Science Fair*  
Improved mean average error by 20% compared to state of the art for creating realistic CT scans from MRIs with Generative Adversarial Neural Networks.

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[github.com/Divide-By-0](https://github.com/Divide-By-0)

[linkedin.com/in/aayushgupta0](https://linkedin.com/in/aayushgupta0)

## AWARDS

### USA Computing Olympiad National Camp Finalist (2016)

Chosen as top 28 pre-collegiate competitive programmers to compete for spot on USA team. Mastered algorithms such as dynamic programming, binary trees, recursion, & shortest path with C++.

### Putnam Top 500 Math Undergrads (2018)

### USA Junior Math Olympiad Qualifier (2016)

Selected as top 200 out of over 70,000 precollegiate students to compete for spot at national camp.

### USA Physics Olympiad Silver Medal (2017)

Recognized as top 150 precollegiate physics students in the USA.

### North American Computational Linguistics Olympiad Finalist (2016)

Recognized as top 50 in USA to compete for national team.

## SKILLS

C++, Python, JavaScript/TypeScript, React.js, Node.js, PyTorch, Java, Firebase, MongoDB, SQL

Data Science, Math, Research, Algorithms, Neural Networks

## MIT CS COURSEWORK (5.0 GPA)

**Current:**

6.864: [Graduate NLP](#)

6.857: Graduate Security

6.033: System Design

**Past:**

6.867: [Graduate Machine Learning](#)

6.438: [Graduate Algorithms for Inference](#)

9.66 Computational Cognitive Science

6.890 [Deep Learning for Algorithms](#)

6.036 [Machine Learning](#)

6.046 Advanced Algorithms

6.041 Probability

6.004 Computation Structures

6.03 EECS for [Medical Devices](#)