



# Ishaan Thakur

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## EDUCATION

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### Cornell University, Ithaca, NY

Aug. 2018 – Dec. 2021

*M.Eng., B.S. in Electrical & Computer Engineering | Computer Science Minor*

GPA: 3.7

**Relevant Courses:** Algorithms, Systems Programming (TA), Deep Learning, Machine Learning, Computer Vision, Image Processing, Operating Systems, Networks, Data Structures, Applied Logic, Embedded Systems, Probability

## PROFESSIONAL EXPERIENCE

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### Chiang's Lab, Cornell University

Ithaca, NY

*Graduate Researcher + Master's Thesis, Advisor: Prof. Hsiao-Dong Chiang*

Sep. 2020 – Present

- Conduct research on improving the accuracy of a dynamic global solver on an ensemble of Differential Evolution, Particle Swarm Optimization and Genetic Algorithms used for image / video-based object detection task.
- Achieved comparable performance against state-of-the-art solvers, with significantly lower complexity overhead.

### On Pepper LLC.

New York, NY

*Software Engineering Intern - Voice Experience Team*

May 2020 – Aug. 2020

- Implemented reference BI tool using NLP techniques such as sentence segmentation, POS tagging, dependency parsing and relation extraction, to gain insights on company's fund asset data.
- Developed a chatbot using React, DialogFlow and MongoDB that reduces average response time by 87%; ran its A/B tests on 1000+ users which recorded retention rate for voice search engagement.
- Improved and redesigned authentication service to allow integration with Auth0 for all employees and users for more secure requests, using JWT validation on the API gateway.

### TestAIing Solutions

Remote

*Software Engineering Intern - Machine Learning Team*

Jun. 2020 – Jul. 2020

- Ideated and built a custom neural network architecture (CNN with BERT embeddings) in PyTorch, capable of performing slot filling and intent classification task on user search queries; improved accuracy by 25%.
- Developed an application that implements training, testing, cross validation and visualizes model interpretability (based on LIME and SHAP values) for 10+ classification methods with a unified interface.

### ESnet, Lawrence Berkeley National Lab

Berkeley, CA

*Software Engineering Intern - Scientific Network Team*

May 2019 – Aug. 2019

- Built a network packet tracing dashboard capable of collecting service quality metrics, monitoring network security and allowing real time debugging on network packets, using Node, React and Cassandra.
- Improved High Touch Services for Network engineers using Node and React: Impact: Improved rendering speed by 10x; added support for 100 Gbps data transfer and packet features filtering.

### Swarm Robotix LLC.

Naperville, IL

*Software Engineering Intern - Sensor Software & Controls Team*

May 2018 – Jul. 2018

- Designed a localization system with Dynamic Window Approach for autonomous mobile robots in ROS using C++.
- Successfully improved collision detection and avoidance by 67%.

## PROJECT HIGHLIGHTS

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### Waymo Open Dataset Challenge

Apr. 2020 – May 2020

- Trained a modified Cascade R-CNN on 600,000+ images, and improved the mAP scores of vehicles, cyclists and pedestrians by 40%, 25%, and 35% respectively.

### Over-the-Air Radio Signal Classification

May 2018 – May 2020

- Implemented a 6-layer Residual Neural Network in PyTorch to classify time-series data, obtained from measuring signals with low-SNR, into one of 10 modulation types with 60% accuracy.

### Weather Web App

Dec. 2019

- Developed a RESTful web app in React using OpenWeatherMap API that displays the current weather information of the queried location, storing data with Firebase.

## TECHNICAL SKILLS

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**Languages:** Proficient: Java, C/C++, Python | Familiar: SQL, JavaScript, HTML, CSS, Go, Verilog,  $\text{\LaTeX}$

**Tools + Frameworks:** MongoDB, MySQL, Node.js, React, Express, Data/ML/NLP Python Libraries, Docker, Git

## HONORS & INVOLVEMENT

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**Honors:** Dean's List • 2<sup>nd</sup> Place, Cornell Robotics Competition (2019) • 1<sup>st</sup> Place, ECE Design Competition (2018)

**Involvement:** Research Assistant, Autonomous Systems Lab • Research Member, WaggleNet • CS 4414 (Systems Programming) Staff • Outreach, ACSU • Member, IEEE