

Hayden Housen

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Education

Cornell University

Computer Science, BS

Aug 2021 – May 2025

- GPA: 3.826, Dean's Honor List, Rawlings Presidential Research Scholar

Work Experience

Machine Learning Intern

Ada Support (Remote)

May 2022 – Aug 2022

- Improved Ada's production accuracy by 8% using only 3% of production data by developing a novel intent classification pipeline.
- Conducted >60 experiments and trained >110 models to determine the most accurate methodology.
- Experimented with knowledge transfer, unsupervised learning of sentence embeddings, multi-task learning, and contrastive losses in the context of transformers and support vector machines.

Undergraduate Researcher

Cornell University AI

Sept 2021 – May 2022

- Overcame bias in paraphrase identification by using transformers & out-of-distribution detection techniques: "GAPX: Generalized Autoregressive Paraphrase-Identification X." Published in **NeurIPS 2022** (3rd author). Advised by Dr. Sernam Lim at Meta AI.
- Experimented with zero-shot image classification via OpenAI's CLIP model.

Machine Learning Intern

Ada Support (Remote)

May 2021 – Aug 2021

- Led the discovery and experimentation phases of a project to enable Ada chatbots to better understand non-English languages.
- Wrote a data processing pipeline to efficiently clean and analyze **9 billion** chat messages for machine learning models.
- Researched novel techniques in multilingual intent prediction and cultivated skills in PyTorch, transformers, and pandas.

Projects

AI Lecture Notes Generation

lecture2notes

Sept 2019 – Jan 2022

- Created a state-of-the-art system to summarize classroom lectures using PyTorch, transformers (BERT), optical character recognition, speech to text, and convolutional neural networks. Source on [GitHub](#). Learn more in the [research paper](#).
- Named a **top 300 scholar in the 2021 Regeneron Science Talent Search**, the nation's oldest and most prestigious science and math competition for high school seniors.
- Deployed ML pipeline in production via a [full-stack website](#) powered by Docker, Flask, Celery, Bootstrap, and Stripe.

Neural Summarization Library

TransformerSum

Mar 2020 – Oct 2020

- Furthered research in neural-network text summarization with a focus on long document summarization. **340+ stars on [GitHub](#)**.
- 4.45x smaller than the state-of-the-art model but 94% as accurate at release. 10+ pre-trained models available.
- Rewrote researchers' code with enhanced performance and a focus on code readability and [thorough documentation](#).

AI Snow Day Prediction

Will I Have A Snow Day.com

Dec 2019 – Sept 2020

- Created an AI-powered automatic snow day predictor website that improves itself over time using user feedback. Powered by XGBoost, scikit-learn, Materialize.css, SendGrid, and Flask. Source on [GitHub](#).
- Scraped school closings and processed **100GB+** of weather data from NOAA to build a snow day dataset.
- Trained a gradient boosting classifier after extensive data exploration and feature engineering.

Cybersecurity Challenges

Capture The Flag

Sept 2019 – Current

- Placed in **top 3%** on average in the PicoCTF 2019/2021/2022 competitions. Learned ethical hacking skills including web exploitation, cryptography, reverse engineering, and binary exploitation. Worked with popular tools included in Kali Linux.
- Wrote technical guides with **over 94,000 views** to document my learning and help others.
- Continuously practicing cybersecurity principles by solving HackTheBox.com machines and [publishing writeups](#).

Technologies and Languages

Languages

Python, Java, JavaScript, HTML/CSS, SQL, OCaml, C

Machine Learning

PyTorch, transformers (BERT), scikit-learn, Lightning, pandas, OpenCV, Spacy, NumPy

Web

Flask, React Native (Expo), Bootstrap, jQuery, web scraping, API design

DB and DevOps

MongoDB, PostgreSQL, MySQL, Docker, AWS, CI/CD, Git