

# Caroline Zhu

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## EXPERIENCE

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### Software Engineer

January 2023 – Present

*Microsoft – ONNXRuntime*

*Redmond, WA*

- Facilitated scalable ML model training on limited-resource devices by expanding on-device training runtime to support ONNX models exceeding 2GB by redesigning the flatbuffers schema and modifying the C++ core.
- Designed, architected, and implemented a TypeScript API for training machine learning models in the browser.
- Presented a talk at the ONNX conference on the TypeScript ML training API.
- Finetuned Phi-3 for Q&A, developing a training script for a generative LLM and modifying an inference ONNX file for training.
- Implemented automated UI testing for Android & iOS apps for on-device testing purposes, by adding an Appium UI orchestration layer to a .NET MAUI app which was built into IPA and APK files and integrating automated testing steps into the Azure DevOps pipelines.
- Conducted performance testing for the CoreML ONNXRuntime backend on MacOS. Adjusted and wrote CoreML operators to cover the performance gaps.

### Software Engineer Intern

May 2022 - July 2022

*Microsoft*

*Bellevue, WA*

- Refactored benchmarking repository for running NLP models locally and on Azure Machine Learning (AML) Compute Clusters, enhancing performance and scalability.
- Developed and maintained Dockerfiles, and contributed examples and bug fixes to the Hugging Face Optimum library, improving usability and functionality.

### Software Engineering Intern

July 2021 - Jan 2022

*Best Buy Health*

*Remote*

- Led the development and launch of an Android app as the primary software engineer, ensuring high-quality performance and user experience.
- Implemented timing and tracking features for two research-focused Android apps using Vue.js, Node.js, and Java. Configured and maintained AWS servers for backend support for the apps.

## EDUCATION

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### Northeastern University

Boston, MA

*Bachelor of Science in Computer Science, Minor in Interaction Design*

*September 2019 - May 2023*

**GPA:** 3.7

**Relevant Coursework:** Natural Language Processing, NLP & Robotics, Algorithms, Object-Oriented Design, Computer Systems, Artificial Intelligence, Database Design, Machine Learning

## PROJECTS

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### Synthetic Data Generation for Vision-Language-Navigation Agents | *Python*

September - December 2022

- Finetuned a Pegasus model (trained on task of paraphrasing) on semantically-paired instructions dataset Room-to-Room, using the transformers library for the Pegasus model and tokenizer.
- Trained the Discrete-Continuous-VLN model on synthetically generated data then compared to baseline Discrete-Continuous-VLN model which were run in the Habitat sim.

### Political Classifier | *Python*

June 2021

- Classified tweets by political party based on American politics. Improved performance metrics by roughly 15% using normalization and hyperparameter tweaking.
- Scraped and processed tweets from Twitter with a Python library. Applied numerous normalization techniques such as removing stopwords, normalizing case, and manipulating emojis and hashtags using Python.
- Employed the transformers library and multiple BERT models to process tweets into vectors. Used Tensorflow logistic regression trained on the labeled tweet vectors.

## TECHNICAL SKILLS

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**Languages:** Python, C++, Bash, Java, TypeScript, JavaScript, C, C#

**Developer Tools:** Git, Docker, Azure, AWS, BrowserStack

**Libraries:** transformers, pandas, NumPy, Matplotlib, protobuf, flatbuffers, ONNX, ONNXRuntime, PyTorch