

# Charlie Zheng

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## Education

### University of Massachusetts - Amherst

Amherst, MA

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

September 2017 - December 2020

- John & Abigail Adam's Scholarship, Dean's List
- **Coursework:** Data Structures, Algorithms, Computation, Operating Systems, Computer Architecture, Artificial Intelligence, Applied Information Retrieval, Natural Language Processing, Advanced Software Engineering, Calculus, Statistics, and Linear Algebra

## Experience

### Microsoft

Redmond, WA

SOFTWARE ENGINEERING INTERN

June 2020 - August 2020

- Worked as a full-stack engineer on the Cloud+AI platform using C# and TypeScript.
- Implemented a new cloud-based microservice to asynchronously register personalized data in Azure EventHub for real-time data ingestion.
- Developed an automated testing suite for unit and integration testing for new services & improved test case coverage by 30%
- Effectively resolved high priority bugs and client issues by taking up ownership of a service used by 100+ client corporations.

### PokeAI

Boston, MA

CO-FOUNDER

May 2019 - May 2020

- Founded a product which establishes a simulation platform for multi-agent problems for corporations, researchers, and practitioners applying reinforcement learning algorithms.
- Used a domain model driven approach and life cycle architecture. The core engine is implemented in C++11 for performance and compatibility with existing packages for scientific computing (openMP, MPI, Gurobi).
- Implemented a Python binding using Pybind11 to dynamically load the shared object from C++11 at run time so that it can be used alongside commonly used Machine Learning libraries such as Numba, SciPy, NumPy, Tensorflow, and PyTorch

### Contractor

Boston, MA

SOFTWARE CONSULTANT

December 2018 - February 2019

- Contributed to the cloud migration effort for a NYSE traded company by designing a parser and lexer grammar using Scala, Java, and Antlr4 for a DSL used as an industry standard for file transfer between financial institutions.
- Used tree traversal, visitor and listener pattern to walk over the parse tree and built the format translator from the standard to JSON/AVRO.
- Automated the translation process saving the company \$100,000-\$200,000 dollars a year in salary for data entry workers.

## Projects

### EleNa Route Recommendation

- Developed a full-stack web application with React, Spring, and MongoDB using TypeScript and Java.
- Designed and implemented an engine to recommend an optimal biking path between two points that balances between minimizing the slope of elevation and the total distance traveled.
- Implemented a login system for users to view past query results.
- Secured account login with JWT (Java Web Tokens) and state management with Redux and Saga.

### Real-Time Social Media

- Developed a full-stack application that highlighted interesting crowd-sourced local events and places of interest in real-time using JavaScript, MySQL & PHP.
- Users are able to select nearby locations or events and like/dislike or post images/comments.
- Implemented RESTful APIs for CRUD operations on events in the database.
- Designed and Implemented an algorithm to only display the most interesting events and remove older uninteresting events.

### Reddit Comment Analyzer (NLP)

- Designed and implemented a comment analysis tool in Python which is able to use topic classification to derive the main topic of a conversation and then classify if a certain comment meaningfully contributes to the conversation.
- Utilized common machine learning libraries including Natural Language ToolKit (NLTK), NumPy, and SciPy.

### Bank & ATM Simulator

- Designed and built an ATM and Bank Simulation platform in C by utilizing pipeline architecture to facilitate communication between a central bank and individual ATMs each identified by a uniquely generated ID.
- Implemented multiple concurrently running ATMs in order to support several simultaneous transactions between multiple accounts with synchronization (locks/mutex) to ensure proper results.

## Skills

**Languages** C, C++, C#, Java, TypeScript/JavaScript, Scala, Python, PHP, HTML/CSS

**Technologies/Frameworks** MySQL, SQL, Git, Antlr4, Firebase, React, Docker, MongoDB, Express.js, Node.js, Axios, Kubernetes, Redux, .NET