Charlie Zheng

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EDUCATION

University of Massachusetts Amherst - Bachelor of Science in Computer Science *Fall 2017 - Fall 2020*

- John & Abigail Adams Scholarship, Dean's List

Coursework - Data Structures, Algorithms, Computation, Operating Systems, Computer Architecture, Artificial Intelligence, Applied Information Retrieval, Natural Language Processing, Software Engineering, Calculus, Statistics, and Linear Algebra

WORK EXPERIENCE

- **Software Engineering Intern - Microsoft** *Summer 2020*
  - Worked on the Cloud + Artificial Intelligence (C+AI) team as a full stack engineer using C# and TypeScript during the Summer of 2020.
  - Contributed to the development of new business software by implementing a new cloud-based microservice to asynchronously register customizable data in Azure EventHub for real-time data ingestion.
  - Developed an automated testing suite for unit and integration testing for new services.
  - Generated impact by having ownership of a service used by 100+ client corporations.
- **PokeAI - Co-Founder**
  - 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, Numba, SciPy, NumPy, Tensorflow, and PyTorch
- **Software Consultant** *Winter 2018*
  - Contributed to the cloud migration effort for a large public financial institution 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.
  - Automated the translation process saving the company $100,000-$200,000 dollars per year for data entry workers.

PROJECTS

- **Instruction Set Architecture Design & Simulator with Assembler**
  - Designed a clean-sheet RISC style instruction set architecture similar to ARM and implemented a simulator in C++.
  - Developed an assembler in C++ that was able to translate assembly code into binary for the simulator.
  - Implemented a memory subsystem (DRAM, multi-level caching), pipelining, logical operations, memory access operations and control flow instructions.
  - Developed performance benchmarks(sort & matrix multiply) in assembly and UI to visualize pipelines and caches.
- **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.
- **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.

RELEVANT SKILLS

Programming Languages: C/C++, C#, Java, TypeScript, JavaScript, Scala, Python, HTML/CSS, XML

Technologies/Frameworks: Assembly, Git, Antlr4, Firebase, React, Docker, MongoDB, Express.js, Node.js, Axios, Kubernetes, Redux, .NET, LaTeX, NumPy, SciPy