Charlie Zheng

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Education

University of Massachusetts - Amherst *Amherst, MA*

Bachelor of Science in Computer Science *September 2017 - February 2021*

- 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.
- Deployed 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 and improved test case coverage by 30%.
- 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

GITHUB LINK

- Led a team to build a full-stack web application with Leaflet, React, Spring Boot, and MongoDB using TypeScript and Java.
- Designed and implemented an engine to recommend an optimal biking path between two addresses that balances between minimizing the slope of elevation and the total distance traveled.
- Utilized Google's Geocoding API to convert from addresses to latitude and longitude.
- Developed an automated testing suite for Java code in JUnit with 100% code coverage.

Search Engine (Information Retrieval)

GITHUB LINK

- Built a fully functioning search engine in Java which processes, indexes, clusters, and ranks query results.
- Implemented retrieval APIs to read query results.
- Utilized NLP algorithms for ranking, clustering, and making predictions about documents.
- Wrote documentation on the functionalities and architecture of the software. Here

Stock Market Sentiment Analysis (NLP)

- Designed and implemented a NLP model in Python that was trained using parsed comment data from popular retail trader forums.
- Utilized a Bag-of-Words model and a Naive Bayes classifier to classify if a particular comment was bullish/bearish and make a prediction about the general sentiment that day.
- Tested results on data leading up to and following COVID-19 and found a 67% accuracy in predicting overall market movement.
- Utilized common machine learning libraries including Natural Language ToolKit (NLTK), NumPy, and SciPy.

Skills

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

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