Ben Cheng

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EDUCATION

University of Toronto　　　　　　　　　　　　　　　　　　　　　　Ontario, Canada
Specialist in Computer Science (Co-op), Major in Statistics (GPA: 3.93 Dean's List)　　*Sep. 2021 – June 2026*

WORK EXPERIENCE

5G Software Developer　　　　　　　　　　　　　　　　　　　　　　May 2024 – Present
Ericsson

- Implemented Deep Q-Network (DQN) to 5G SRS Scheduling and RL Algorithm to 5G Antenna Calibration, catering to network providers including Bell and CMCC
- Collaborated on the implementation of Embedded Real-time Communication C++ Application, establishing synchronization between Inference Model, RL Training Server and InfluxDB Time-Series Database
- Participated in the research, implementation and Field Test Time-Series analysis of AiXellerator application, leading to 20% boost in real-time downlink throughput and 10% boost in spectral efficiency (Link)

Full Stack Developer　　　　　　　　　　　　　　　　　　　　　　Sep 2023 – Apr 2024
Centre for Social Services Engineering

- Implemented a responsive search engine with GraphDB and React, featuring multi-condition filtering and pagination, and constructed a Material-designed user interface constructed by React and TypeScript
- Optimized and streamlined SPARQL queries with Lucene integration, enhancing system efficiency and reducing search time by more than 60%, with improved system robustness and scalability
- Collaborated on a full-stack project, connecting Ontotext Graph Database with NodeJS backend codebase, constructed efficient data pipelines for information sharing, with comprehensive test coverage using Jest library

Software Engineer　　　　　　　　　　　　　　　　　　　　　　　May 2023 – Present
Middleware Systems Research Group

- Designed and developed a modern web application using Django CMS and Nginx, featuring a custom-built search engine crafted with scikit-learn
- Implemented a GitHub Actions CI/CD pipeline for automating code integration, Docker container deployment on the testing server, and the periodic management of secure HTTP certificates
- Integrated the Google Scholar API with MySQL and Redis databases to update and manage the publication information of research projects and collaborators

Software Engineer　　　　　　　　　　　　　　　　　　　　　　　Dec 2023 – Feb 2024
ActEarn (Startup)

- Contributed to the development of an AI-integrated social application designed to foster lasting connections between students and alumni, utilizing GAN and LLM model to enhance user engagement and network growth
- Leveraged React Native to develop a responsive mobile chat interface, integrating backend services with SendBird for real-time messaging and Clerk for user authentication, enhancing user experience and operational efficiency

PUBLICATIONS

(First Author) Open Datasets for Grid Modeling and Visualization　　　　　　Apr 2025
Ben Cheng, Yize Chen　　　　　　　　　　　　　　　　　　　　　　　　*arXiv*

- Utilized Linear Programming and Topology Analysis to reconstruct grid topology from public datasets
- Reconstructed on-time nodal demand and supply distributions to visualize Alberta's electricity flow.
- Pioneered data-driven approaches for regional-to-national power flow and carbon emission distribution analysis.

Research Experience

Research Assistant (Energy System + Graph Algorithm)   July 2024 – Present
UAlberta Electrical and Computer Engineering

- Investigated and implemented a carbon emission tracing algorithm on Alberta's electricity network, aiming to visualize and analyze provincial-level or national-level carbon emission distribution
- Utilized the Power Dispatch Model with BFS and LP algorithms to formulate, derive, and evaluate the contribution of individual generators and visualize the power distribution and consumption distribution
- Supervised by Professor Yize Chen at the University of Alberta

Research Assistant (Medical Time-Series Machine Learning)   Jan 2025 – Present
Vector Institute, University Health Network

- Investigated the influence of Recurrent and Feedforward Neural Networks in predicting Tacrolimus Dose Requirement for liver-transplant patients, aiming to optimize the clinical medicine dose selection
- Conducted neural network application experiments on liver-transplant datasets from University Health Network
- Supervised by Processor Michael Brudno and Professor Rahul Krishnan at the Vector Institute

Research Assistant (CSP + Wi-Fi Signal Positioning + LLM)   Jan 2024 – Apr 2024
Dynamic Graphics Project (DGP) Lab

- Developed a spatial-aware cartography application supporting indoor position estimation, relative rooms position reasoning and auto-decision during measurement and training process
- Researched the potential of utilizing CSP algorithm for relative relationship deduction and LLM for description organization and decision making
- Supervised by Professor Khai Truong at the Dynamic Graphics Project lab

Projects

Student Assessment Prediction | *PyTorch, Numpy, Pandas, Scikit-learn, Scipy*   (Nov 2023 – Dec 2023)
- Participated in a ML project focused on predicting learning efficiency using Item-Response Theory (IRT)
- Conducted comprehensive analyses using multiple algorithms, including KNN and Matrix Factorization, to enhance the accuracy of predictions regarding students' test results

MovieReviewShare | *React, NodeJS, Express, MongoDB, Redux, Tailwind CSS, Azure*   (July 2023 - July 2023)
- Developed a movie-review platform application using NodeJS, ExpressJS and RESTful API
- Deployed backend and database server on Microsoft Azure and MongoDB Atlas cloud platform

SoftStore | *React, Spring Boot, Spring Data JPA, Material UI, TypeScript, Redis*   (May 2023 - June 2023)
- Architected a comprehensive e-commerce platform leveraging Spring Boot, React, Spring JPA, and Redis
- Integrated Sa-token authorization and authentication framework, aiming to strengthen data security

Mini Eventbrite | *JDBC, SQL, Java, Swing UI, Git*   (Sep 2022 – Dec 2022)
- Steered a team of seven in the development of a Java application similar to Eventbrite
- Established robust database pipelines to facilitate efficient data extraction for each feature, enhancing the application's performance and scalability

Technical Skills

Languages: Java, Python, C, C++, MATLAB, Cuda, JavaScript, TypeScript, HTML, CSS, PHP, R, Go
Backend: NodeJS, Express, Spring Boot, Django, Microsoft Azure, Google Cloud Platform, XAMPP, OAuth 2.0
Frontend: React, React Native, Material UI, Tailwind CSS, Redux, Expo, Selenium, Beautiful Soup
Database: Spring JPA, MyBatis, MySQL, PostgreSQL, SPARQL, Ontotext GraphDB, MongoDB, Redis, Lucene
Developer Tools: Git, Docker, Nginx, Gitlab, Jenkins, Gerrit, Figma, CMake, Makefile, MSVC, GCC, MinGW, Vite
Technologies: PyTorch, Scikit-learn, Numpy, Pandas, Scipy, FsUe Testing, RealUe Testing, Linux, Jest