Zijun Zhao

Email GitHub

EDUCATION

McGill University - Bachelor's Degree Sept. 2019 – April. 2023

- Program: Joint Honours Mathematics and Computer Science
- GPA: 3.95 / 4.00 (Faculty Top 5%)
- Awards: Dean's Honour List, Faculty of Science Scholarship, Tomlinson Engagement Award for Mentoring (TEAM)

SKILLS

- Programming Languages - Java, Python, C, MATLAB, OCaml (a functional programming language), Javascript, SQL
- Development Tools - Linux shells, Git, GitHub
- Web development - HTML/CSS/Javascript, React, Java Spring, Django, Flask
- Typesetting - LaTeX
- Languages - English (proficient), Mandarin (native)

PROJECT EXPERIENCE

Mini-C Compiler (Java, JUnit)

- A full compiler of a subset of C that outputs MIPS assembly. Built from scratch. Components include: tokenizer, recursive descent parser, name analysis, type checking, code generation, graph-coloring based register allocator. The mini-language is also equipped with basic OOP support (classes), e.g. inheritance, polymorphism (virtual dispatch).

Trip Planning Tool for Truck Drivers (Java)

- An application that efficiently plans the optimal trip of truck loads from the marketplace for a trucker, given the times that the driver wants to start and finish working and the start location that the trucker prefers. I crafted the core algorithm of this project, leading to the 2nd place of the sponsor prize at McGill Code Jam 2022.

  code hackathon

Machine Learning Kaggle Competition (Python, PyTorch)

- Participation in a Kaggle competition on classification of combinations of hand-written digits and letters, held in the machine learning course. In the competition I employed a model similar to AlexNet and various data processing techniques, achieving 2nd place on the public leaderboard, 3rd place on the private leaderboard out of 90 teams.

  code competition

Hate Speech Detection with Convolutional Neural Networks (Python, PyTorch)

- Hate speech detection with character level CNN and word level CNN based on Word2Vec. The effect of various text preprocessing and augmentation techniques on the two types of CNN are studied. Accomplished as the final project of a NLP course.

  code

Computer Vision Gadgets (MATLAB)

- A set of computer vision gadgets. Implemented functionalities are relevant to topics such as epipolar geometry and stereo vision.

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Board Game AI (Java)

- An AI agent for Pentago, a game with a high branching factor (200+). Algorithms employed include alpha-beta pruning and MCTS. The AI agent was ranked top 10 among 300+ submissions in the class tournament.

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Related Coursework

- COMP 520 Compiler Design - Principles of compiler design.
- COMP 421 Database Systems - Database design, database manipulation, and database implementation.
- COMP 551 Applied Machine Learning - General principles of machine learning and various algorithms, including decision trees, support vector machines, neural networks.
- COMP 550 Natural Language Processing - Computational modeling of natural language, including algorithms, formalisms, and applications. A number of NLP tasks and methods are examined. E.g. automatic summarization, machine translation.
- COMP 558 Computer Vision - Problems and methods in 2D and 3D computer vision. E.g. image feature extraction, motion tracking, stereo camera.
- COMP 424 Artificial Intelligence - Various types of artificial intelligence are covered, such as knowledge representation, planning under uncertainty, reinforcement learning. A game AI is implemented as the final project for this course.
- Other CS courses: software design, operating systems, computer systems, algorithm design, functional programming, theory of computation, etc.
- Courses in mathematics: linear algebra, discrete mathematics, probability, statistics, multivariate calculus, numerical analysis, mathematical logic, abstract algebra, mathematical analysis, etc.