Haoran Zhu

University of Waterloo Computer Engineering 3A
Sep 2021- Jun 2027
The websites that I designed:
• Haoranzhu.com
• Topmanclub.org
• Toknowlaw.com

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GitHub Profile
LinkedIn Profile

Technical Skills and Interests

Programming Languages: C/C++, Python, Go, Java, JavaScript, XML/HTML/CSS, Matlab, Assembly Language, VHDL, PLC Programming
Technologies and Frameworks: Pytorch, RESTful, Postman, Unix, Linux, Docker, Visual Studio Code, Clion, Pycharm, Navicat, Tabby, Vue, Network Attached Storage, Eclipse, Git/Github, Azure Devops, Make build automation tooling, Node, React, RAG

Work Experience

- **University of Waterloo** *Sept - Nov 2024*
  AI In Education Research and Development Assistant Waterloo, Ontario
  – Develop solutions for automated tutoring and automated grading/feedback generation using LLMs.
  – Evaluate LLMs using Python for their suitability in automated tutoring and grading/feedback generation.
  – Develop web interfaces, both frontend and backend for the deployment of AI systems Curation and analysis of datasets obtained through user interactions with AI systems.
  – **Python, Pytorch, FastAPI, SQLAlchemy, ChromaDB, RAG, GPU Programming, Transformer, HTML, JS, CSS**
- **Baidu Inc** *Jan - Apr 2024*
  ERNIE Bot Software Engineering, Fullstack Lianyungang, Jiangsu
  – Work with the research team to get relevant feedback and iterate on the latest Ernie Bot models, optimize Baidu's Azure VMs's code.
  – Optimize applications for speed and scale.
  – **Python, Pytorch, RESTful, Azure, Docker, Django**
- **Baidu Inc** *May - Aug 2023*
  ERNIE Bot Machine Learning and Software Development Assistant Lianyungang, Jiangsu
  – Responsible for assisting Baidu's Software Engineers to maintain the data source, design and develop a data pipeline for management by using Python, Docker and Recurrent neural network.
  – Use the latest techiniques and methods in deep learning such as PP-LCNet and RL in order to analyze and improve the learning process and data validation.
  – Apply API deployment to deploy the new features of Ernie Bot on Baidu's apps.
  – **Python, Docker, Recurrent Neural Networks (RNN), API Development**

Personal Projects and Research Publications

- **Enhancing Contextual Understanding in AI-Powered Tutoring: Evaluating the Oliver System for Effective Learning Support** *Fall 2024*
  Haoran Zhu, Michael Cooper-Stachowsky and Zille Huma Kamal
  – **Role:** Lead Researcher and Developer
  – Researched AI-powered tutoring systems, focusing on improving contextual understanding through memory management and dynamic responses.
  – Designed and implemented Oliver's core architecture using advanced prompt engineering and conversational memory to enhance learning.
  – Evaluated performance through testing and analysis, showing improved student engagement and outcomes.
  – Collaborated on publishing the manuscript for ICEIT 2025, showcasing Oliver's innovation and educational applications.
- **Navigation Graph** *Winter 2023*
  Design and implement a graph data structure to store a weighted, undirected graph.
  – **C++, Algorithm, Make, Graph, Stack, Priority Queue, Heap, Illegal Exception**
  – Design and implement a graph data structure to store a weighted, undirected graph.
  – Implement Dijkstra's algorithm to determine the lowest-weight path between two vertices.
  – The vertices represent intersections in a city and the edge weight represents the travel time between the two intersections.
- **LLMs-Tokenization** *Winter 2023*
  Implement a hash table data structure to solve the problem of tokenization in AI systems
  – **C++, Algorithm, Make, Hash Table, ASCII, Primary Hash Function , Illegal Exception**
  – A C++ implementation for a hash table data structure. In this data structure, keys/values are mapped to a position in a table using a hash function.
  – Implement hash tables which resolve collisions using separate chaining.