DANIEL LI LIU

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EDUCATION

University of Toronto | Computer Engineering (3rd Year)
September 2020 - April 2025

- ***3.84 / 4.00 cGPA***
- Artificial Intelligence Minor
- Business Certificate

EXPERIENCE

Machine Learning Researcher | iQua Research Group (***Summer 2022***)

- Conducted experiments using reinforcement learning algorithms such as TD3 for machine learning models
- Explored design space for when models should forget old data based on interference
- Implemented reinforcement learning for clients in the federated learning framework *Plato https://github.com/TL-System/plato/tree/continual_RL/examples/td3_learning*

PUBLICATIONS

Lethe: Interference-Based Forgetting for Continual Learning Agents in Reinforcement Learning
Salma Emara, Baochun Li, Tim Zeyl, *Daniel Liu* (*Under review)*

ENGINEERING PROJECTS

Reinforcement Algorithms in Federated Learning Framework Plato

- Extended research framework Plato to support reinforcement learning for clients
- Designed a custom model to support actor and critic models used in **TD3 & A2C**
- Created a customized trainer for both the **TD3 & A2C** algorithm that evaluates/saves average rewards for clients and the server
- Implemented a custom algorithm that communicates between the server & clients

Project Links:
https://github.com/TL-System/plato/tree/continual_RL/examples/td3_learning
https://github.com/TL-System/plato/tree/continual_RL/examples/park_env

Mapping Application with Intelligent Trip Planning

- Created and designed fully functional **intelligent** map, similar to google maps
- Organised large amounts of data into data structures C++ STL
- Implemented full graphics with a user-friendly interface
- Implemented an optimal algorithms for path finding
- Created smarter algorithms for path finding and travelling salesman using heuristic

GoTime - NewHacks Hackathon Project, 4th Place Winner

- Created and designed a **web app** using the Electron Framework, leveraging JavaScript, HTML/CSS, and Node.js.
- **Optimized** university student's schedules/time and class locations at the University of Toronto using Dijkstra's algorithm for an optimal path with C++

Project Link: https://devpost.com/software/gotime-jbksxl

Processor Design Project

- Designed a 16-bit with a total of 8 register processor using Verilog
- Implemented assembly language instructions and flag checking
- Incorporated input and output devices on the DE1-SoC board

AWARDS

Deans List (***2020-2022***)

Natural Sciences and Engineering Research Council of Canada's Undergraduate Student Research Award (***2022***)

TECHNICAL SKILLS

LANGUAGES

- C / C++
- Python
- Java
- MATLAB
- JavaScript
- ARM Assembly

WEB DEVELOPMENT

- HTML / CSS

SOFTWARE

- Git
- GTK / EZGL
- PyTorch

HARDWARE

- Verilog
- Quartus / Modelsim
- Breadboards
- DE1-SoC Boards

AREAS OF INTEREST

- Artificial Intelligence
- Machine Learning
  - Reinforcement Learning
  - Continual Learning
- Software Design/Development