

# Alan Yuan

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## WORK EXPERIENCE

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### Amazon

Jun 2023 – Aug 2023

*Software Developer - Intern*

*Toronto, Ontario*

- Due to network latency and processing time, consolidation recommendations take over **150ms** to retrieve
- Designed and implemented a precompute layer to increase consolidation recommendations speed by **99%**
- Created automated data analysis tool to ensure predictions are above **75%**

### PAIR Lab

Sep 2021 – Present

*Researcher*

*Toronto, Ontario*

- Built on top of **NVIDIA's** Isaacsim to create a robot reinforcement learning **framework**
- Utilized state-of-the-art techniques to solve **long-horizon robotics tasks** with minimal human input

### Amazon

May 2022 – Aug 2022

*Software Developer - Intern*

*Vancouver, British Columbia*

- Engineered a modular microservice in **Java** to send notifications to customer of cashback on select products
- Utilize **AWS** webservices such as **Lambda**, **SQS** and **SNS** to ensure scalability of the notification system

### Intel

May 2021 – May 2022

*Software Engineer - Intern*

*Toronto, Ontario*

- Developed flagship product using C++, Python and Bash for speedup by re-routing the compilation
- Developed support software to generate 4000+ of completely random test-cases for edge-case testing
- Optimized support tool's Ram templates to reduce false positives and failing cases by around **70%**

### Centivizer

Apr 2020 - Sep 2020

*Software Developer - Part-time*

*Toronto, Ontario*

- Designed and wrote backend application using **Node.JS** and **SimplePeer** to connect users via video call

## EDUCATION

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### University of Toronto

— cGPA

*MSc Applied Computing*

*Sept 2023 - Jan 2025*

### University of Toronto

3.84 cGPA

*HBSc Computer Science Specialist, Major in Mathematics*

*Sep. 2018 – May 2023*

**Relevant Coursework:** Data Structures and Algorithms (A+), Operating Systems (A+), Parallel Programming (A+), Neural Networks and Deep Learning (A+), Intro to AI (A+), Introduction to Machine Learning (A+), Algorithm Design, Analysis & Complexity (A)

## PUBLICATIONS

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M. Skreta\*, Z. Zhou\*, **J. L. Yuan\***, K. Darvish, A. Aspuru-Guzik, A. Garg. Lidless Eye and Silver Tongue: using Vision and Language for Adaptive Task Replanning, *Submitted to (ICLR) 2024*

M. Mittal, C. Yu, Q. Yu, J. Liu, N. Rudin, D. Hoeller, **J. L. Yuan**, R. Singh, Y. Guo, H. Mazhar, A. U. Mandlekar, B. Babich, G. State, M. Hutter, A. Garg. ORBIT: A Unified Simulation Framework for Interactive Robot Learning Environments, *(RA-L) 2023*

(\* equal contribution)

## PROJECTS

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- Planning long horizon tasks with LLMs (pair lab)** | Private repo Sep 2023 – present
- Exploring the usage of **VLM** assisted **LLM** in long term planning through constant re-evaluation of plans
  - Utilizing a combination of **MPC** and **LLMs** to complete complex low level tasks using **MuJoCo** MPC
  - Exploring meta controllers to assist multi-policy agents to plan long horizon tasks using **sparse rewards**
- Orbit (pair lab)** [open source] | Link: website Jan 2022 – May 2023
- Designed and built **GPU** parallelized state systems with low overhead allowing a **4x** speedup over the cpu solution
  - Utilize pytorch and PPO libraries such as rsrl, rlgames and rllib to train various robots on various environments
  - Implemented features including rigid/articulated body environments for benchmarks and robot configurations
- CaNetDa: Deep Learning for GeoGuesser in Canada** | Link: GitHub Jan 2021 – Apr 2021
- Utilized a deep learning approach utilizing multiple deep learning techniques to have an AI play GeoGuesser
  - Mined dataset and trained an ensemble of **ResNet**, **EfficientNet** and **Vision Transformer**.
  - With our approach, a accuracy of **60%** was consistently achieved out of 13 options
- Machine Learning Course Competition** | Link: GitHub Sep 2020 – Dec 2020
- Chose and implemented a Matrix Factorization SGD algorithm to recommend a selection of movies to users
  - Achieved the 5th highest score in the unsupervised movie recommendation competition.
  - Improved on the **SGD** training process by adding weight regularization and biases based on reseach papers

## PERSONAL PROJECTS

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- Contextual image generation** | Private repo May 2023 – present
- Implemented a naive, text to text implementation of multi modal image generation
  - Reproducing the **Generating Images with Multimodal Language Models** paper
- Tenant-Landlord Matching App** | Links: server-side, client-side Aug 2020 – Jun 2021
- Fullstack development of an mobile application to match landlords and tenants
  - Constructed front-end using **React Native** and common packages such as **React Navigation** and **axios**
  - Features: Authentication, images upload utilizing **multer**, Tinder-like swiping, instant messaging with **Socket.io**
  - Utilized **Node.js**, **GraphQL**, and database **Postgres** to construct backend
- Tron UDP Multiplayer** | Link: GitHub Sep 2019 – Dec 2019
- Created a four player game for local networks using the **UDP** network protocol and C++
  - Utilize **epoll** for both client and server to monitor the socket as well as the timer (server) and stdin (client)
- BF-Interpreter** | Link: GitHub Mar 2018 – Nov 2018
- Built a BF shell that runs all example BF programs found on Wikipedia in C

## TECHNICAL SKILLS

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**Languages:** Python, C/C++, JavaScript, Java, C#

**Tools:** PyTorch, Git, React Native, Node.js, MongoDB, SQL (Postgres), Numpy, GDB, GraphQL