SHON VERCH

(+1) 416-399-4003 • **mail:** verchshon@gmail.com • **github** /galacticglum • **in** /shon-verch

EDUCATION

University of Toronto *Sept 2020 - May 2025*

Candidate for Honours Bsc, Computer Science (3.81 / 4.0 GPA)

WORK EXPERIENCE

Software Engineer Intern, *Microsoft* *May 2024 - Aug 2024*

- Contributed to Azure Data Manager for Energy by developing internal tooling and Git automation pipelines.
- Designed and deployed **AutoResolve**, an LLM-based merge conflict resolution algorithm using **few-shot prompting, meta-judge,** and **agent chaining** techniques, achieving a **65%** resolution accuracy.
- Eliminated manual effort in code upgrades by building a **Python** service to automatically identify and sync latest changes from upstream repos into the teams' divergent forks.
- Significantly reduced the teams' merge conflict volume by integrating AutoResolve into daily upgrade workflows.

Machine Learning Researcher, *University of Toronto (SocialAI Lab)* *May 2023 - May 2024*

- Authored **Artificial Dopamine**, a novel biologically plausible RL algorithm that achieves competitive scores on a panel of standard RL benchmarks, without the use of backpropagation. Paper accepted into **NeurIPS 2024**.
- Led the development of **Gem**, a **Python** package simplifying the creation of complex RL environments, reducing development time from months to weeks. Adopted by **50+** researchers at the University of Toronto.
- Designed fast implementations of deep RL algorithms in **JAX & PyTorch**, achieving a **40x+** training speed-up.

Software Engineer Intern, *IBM* *May 2022 - Aug 2023*

- Contributed to a full-stack **Ruby on Rails** app on the Skills Network team: enhancing UI/UX with **Tailwind, Stimulus.js**, and **JavaScript**, and writing unit/integration tests with **RSpec**.
- Built an app integration system that was key in automating workflows for users on our platform. Used it to integrate **Slack** and **Box** APIs leading to a **75%** reduction in administrative task time.
- Optimized our data pipelines leading to an **80%** reduction in average page load time and enhanced user satisfaction for a community of **1,000,000+** authors and learners on the Skills Network platform.
- Reduced operating costs by **15%** by leveraging the **IBM Cloud** platform to efficiently allocate cloud resources.
- Developed a content sharing system to streamline collaboration on educational content among team members.
- Built **JupyterLab & JupyterLite** extensions for authoring code on the cloud using **Flask, React,** and **TypeScript**.

Undergraduate Research Assistant, *University of Toronto* *May 2021 - May 2023*

- Investigated how stereotypes shape the predictions made by **ResNet**-based facial recognition models.
- Simulated large-scale sociology experiments involving **100K+** artificial 'participants' with **Python** and **PyTorch**.
- Developed a **multi-threaded** tool to efficiently generate **millions** of highly-realistic 3D faces using **Python** and **C++.**

PROJECTS

Sqrl Planner | *Next.js (React), TypeScript, Flask, Python, MongoDb*

- Built a beautiful timetable planner used by **3,000+** students at the University of Toronto
- Deployed app to a highly available **Kubernetes** cluster complete with **Prometheus** monitoring; implemented a robust **GitOps** workflow using **Helm** and **ArgoCD**; setup automated infrastructure provisioning with **Terraform**.
- Designed a fault-tolerant microservice architecture for aggregating data from publicly available sources.

Hearthstone Battlegrounds (HSBG) Agent | *Python, PyTorch, C/C++, Deep Q-learning, MCTS*

- Achieved an **80%** win rate against random and greedy players using self-play Deep Q-learning and MCTS.
- Built a multi-threaded **C++** HSBG simulator as a **Python C extension**, achieving **10,000** simulated games/minute.

SKILLS & INTERESTS

Languages	C, C++, Python, C#, Java, Ruby, JavaScript (React.js & Node.js), HTML/CSS, SQL, R
Tools	Azure, Kubernetes, IBM Cloud, GCP, Docker, GitOps, Make, JAX, PyTorch, Unity, Unreal Engine 4