

# Shaibal Muhtadee

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## EDUCATION

### University of Toronto

Bachelor of Applied Science in Computer Engineering (Co-op)

Toronto, ON

Sept 2020 – Apr 2025

## EXPERIENCE

### Robotics Software Engineering Intern

Zebra Technologies

May 2023 - Sept 2024

Toronto, ON

- Designed and deployed **authentication** and **authorization** servers, securing access for **200+** autonomous robots
- Engineered secure **API** endpoints in **TypeScript**, enabling management of sensitive data like API keys and **JWTs**
- Crafted a user interface with **Flutter** and **Cloudflare Pages**, for securely accessing the custom **secret store**
- Developed a **comprehensive test suite** in Rust that eliminated **99%** of system bugs, ensuring a reliable API
- Automated **CI/CD** pipelines and containerized microservices using **Docker**, with deployments in **Kubernetes**
- Assisted in creating a secure **object store**, streamlining **file management** for data uploads and downloads
- Implemented a **Model Predictive Control** for a SpeedyBee **drone** using **iNAV**, enabling semi-autonomous flight

## PROJECTS

### GanttWise | Python, React, Node.js, MongoDB

Aug 2024 - Present

- Developed an **AI**-powered web platform using **Deep Reinforcement Learning** to automate task scheduling and resource allocation for project managers, improving project adaptability in dynamic environments
- Utilized **TensorFlow**, **React**, and **Node** to build a custom deep reinforcement learning model, and integrated it into a full-stack web application with **MongoDB** for database management

### Computer Graphics Library | C, C++, Visual Studio

Sept 2024 - Present

- Developed a comprehensive graphics library implementing core concepts, algorithms, and techniques in computer graphics, including **ray casting**, **ray tracing**, and **shader pipelines**
- Optimized **rendering** performance through **bounding volume hierarchy**, enabling real-time simulation of animations and complex 3D scenes

### Searchington | Python, Bottle, SQLite, Redis

Sept 2024 - Present

- Built a web **search engine** with a crawler that recursively visits URLs, extracts HTML, creates word lists, and stores data in **SQLite**, using an inverted index to deliver relevant search results
- Implemented **caching** with Redis to optimize query performance, improving response times by over **200%**

### Portfolio - shaibalmuhtadee.com | TypeScript, React, NextJS, TailwindCSS

Jan 2023 - May 2023

- Created a responsive portfolio website with **React** and **TailwindCSS** to showcase my personal projects
- Utilized **TypeScript** and **React Hooks** to implement two themes and various interactive UI elements
- Leveraged the **NextJS** framework to improve **SEO** and simultaneously decrease site load times by **150%**

### ChromaMap | C, C++, OpenStreetMap API, GTK Library, Git

Jan 2022 - Apr 2022

- Created a **Geographic Information System** mapping software using **C++** and the OpenStreetMap **API**
- Implemented **Dijkstra algorithm** and **A\* pathfinding heuristics** to solve the travelling salesman problem
- Improved browse and load times by over **300%** by developing a **Level of Detail** tiling scheme for the map
- Optimized application speed by **multi-threading** and code visualization, **stack trace** and **flame graphs**

## PROGRAMMING SKILLS

**Languages:** Python, TypeScript, Rust, C/C++, Dart, SQL, HTML/CSS, ARMv7 Assembly

**Frameworks:** React, Node.js, Cloudflare Pages, Flutter, Django, Flask, Bottle

**Developer Tools:** Git, Linux, Docker, Kubernetes, Google Cloud Platform, AWS, Visual Studio

**Libraries:** NumPy, TensorFlow, Redis, Scikit-learn, Matplotlib, GTK