# **Gnanavel Premnath**

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### **Education**

**Simon Fraser University** 

Burnaby, BC

Bachelor of Science in Computing Science

July. 2025 (expected)

Relevant course work: Data Structures/Algorithm, Discrete Mathematics, Database Management, Machine Learning, Computer vision

## **Experience**

### **HCI Research Assistant**

Simon Fraser University | ixLab | Advised by Lawrence Kim

January 10, 2022 - present

- Led in-person lab VR studies and conducted usability testing to identify and correct suboptimal posture during gameplay.
- Engineered interactive VR interventions, such as environmental cues and visual feedback, to guide users to correct posture.
- Synthesized quantitative data from VR trails to evaluate posture-correcting strategies and enhance user engagement.

# **Projects (Selected)**

Hackathon (Red Sea App) | Flask, Machine Learning, ReactJS, MapBox API

March 9, 2024

- Implemented forward geocoding to translate user-entered addresses into latitude and longitude for map placement.
- Utilized a K-Nearest Neighbours classifier to predict and recommend the safest routes by analysing geographic coordinates.
- Secured second place (runner up) on the Hackathon track, effectively contributing to the team in a competitive environment.

**Brain Tumour Detection** | Python, Machine Learning, PyTorch, OpenCV, Image Processing

Dec 25, 2023

- Developed and trained a neural network model to distinguish between malignant and benign tumours from MRI scans.
- Built and fine-tuned convolutional neural network architectures in PyTorch.
- Implemented custom data loaders and training loops to better understand neural network fundamentals.

Smart Self-Checkout (Group project) | Python, Computer Vision, YOLO, Google Colab

Jan 10, 2024

- Developed a self-checkout system using a custom-trained YOLO model to identify and price multiple grocery items.
- Labelled a series of images and trained using Google Colab with free GPU.
- Programmed the system to recognize between 25+ unique products with its corresponding price.

Conversational AI Assistant | Flask, LangChain, NextJS, TailwindCSS, REST API, MySQL, AWS hosting

Nov 8, 2023

- Implemented custom AI virtual assistant to support multiple chat sessions, seamless browsing between different sessions.
- Utilized LangChain to fine-tune the model, enabling the AI to learn and generate responses from newly added information.
- Used Next.js and Tailwind CSS for server-side rendering, managed data with MySQL, and hosted the application on AWS.

### **Volunteer Experience**

#### **Competitive Programming** | *member*

January 2023

- Engage in collaborative problem-solving and algorithmic challenges to improve coding skills and computational thinking.
- Regularly attend workshops and discussions to learn advanced programming techniques and prepare for competitions.

#### **Technical Skills**

Languages: Python, Matlab, C#, C/C++, Java, HTML, CSS, JavaScript, SQL, PHP

Frameworks/Tools: React, NextJS, NodeJS, Express, MongoDB, Tailwind CSS, Docker

Others: Git, Google Cloud, AWS, LaTex, Notion, Figma, Adobe Softwares, Github, Postman, GitHub

### **Certifications**

Machine Learning Specialization by DeepLearning.AI, Stanford University (Coursera, 2023)