Nuthanan Tharmarajah

nuthanan.com | github.com/nuthanan06 | in/nuthanan-t | n2tharma@uwaterloo.ca

Technical Skills

Languages: Java, Python, C/C++, Postgres, MongoDB, JavaScript, Typescript, HTML/CSS
Frameworks: React, Node.js, Firebase, TailwindCSS, Bootstrap, Flask, Next.js, FastAPI, PyTorch, Tensorflow, Keras

Experience

Firmware Developer Sep. 2024 – Present
University of Waterloo Formula Electric *Waterloo, ON*

- Developed firmware automation scripts using Python and CAN interfaces for electric vehicle control systems, enhancing parameter retrieval efficiency by **18%**
- Managed code using **Git and Github** ensuring version control, collaboration and efficient project management
- Collaborated with **30+ members** on hardware-in-the-loop testing using **Simulink** to enhance software robustness

Lead Website Developer June 2024 – August 2024
K&T Construction Service *Toronto, ON*

- Developed a responsive website using **HTML and CSS** to showcase the company's services and projects
- Engaged with **20+ staff** to gather requirements of website application **through surveys** to ensure alignment with client needs and expectations, improving website engagement by **47%**
- Increased website traffic by **30%** over three months by optimizing load times and SEO using **Google Analytics**

Projects

Teabag | *Next.js, Typescript, TailwindCSS, Python, Flask, Firebase, Langchain* January 2025

- Developed an accessible **Next.js** web app with **TypeScript and TailwindCSS**, enabling users to input and receive summarized stories via speech or text, improving inclusivity for diverse user needs
- Integrated **SpeechRecognition** React library and **Cohere API** using **Flask** for real-time voice transcription and AI-driven story summarization
- Implemented **Firebase Firestore** for data storage, allowing users to retrieve and extend previous conversations

Independent AI Research | *Python, SNNTorch, PyTorch* Jan. 2024 - Sep. 2024

- Investigated a biologically plausible **learning algorithm** for **spiking neural networks** using **SNNTorch**, focusing on **spike-timing-dependent plasticity and localized learning methods**
- Researched the mathematical impact of **loss functions** on accuracy and efficiency in **neural network regression tasks** using **PyTorch**, concluding that more complex loss functions improve accuracy but reduce efficiency

AI Skin Cancer Detection | *Matplotlib, Pandas, PyTorch* July 2023 - August 2023

- Programmed a **convolutional neural network (CNN)** model on a skin cancer dataset using **PyTorch** to identify seven different skin lesion types, enhancing accuracy through rigorous testing and tuning
- Preprocessed each dataset to contain **5000 images per lesion** using **PyTorch's** data augmentation feature, ensuring uniformity during training, improving accuracy by **14%**
- **Fine-tuned** and compared **ResNet50 and DenseNet121** neural network models to fit task using **Matplotlib**, resulted in a **74% accuracy** using the ResNet50 model

Community Creator | *React, Flask, Python, Tailwind CSS, Cohere API* April 2022 - May 2022

- Developed a web app using **React and TailwindCSS** to deliver feedback on community sustainability practices
- Implemented a **Flask** back-end with **Cohere API** to generate personalized suggestions based on user input
- Used **JSON and JavaScript** to store user responses and handle requests to **Cohere API** for data retrieval

Education

University of Waterloo Waterloo, ON
Bachelor of Software Engineering *Aug. 2024 – May 2029*

- **GPA:** 4.0/4.0
- **Activities and Societies**: Model United Nations, Tamil Student Association, Yearbook Class Representative