Wallace Lee

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Skills

Languages Python, C++, SQL, MATLAB, HTML/CSS, JavaScript.
Libraries PyTorch, TensorFlow, Scikit-learn, OpenCV, DjangoREST, React
Tools Colab, Anaconda, AWS, Bash, Linux, Microsoft Office, GitHub, Git, Linux, Mac
Hardware RaspberryPi, Solidworks, Arduino

Experience

Undergraduate Research Assistant — *Waterloo ON*

Vision and Image Processing Lab — *September 2023 - Current*

- Research on Generative AI for expanding the size of COVID X-Ray dataset (GenAI4Good)
- Research on Generative AI generating Live2D model model rigging and Computer Vision on motion capture

Research Programming Intern — *Toronto ON*

Sunnybrook Research Institute - Focused Ultrasound Lab — *May 2023 - August 2023*

- Achieve 99.97% time reduction in MRI regional segmentation by implementing 3D and 2D Machine Learning pipeline with 89.5 dice score
- Create a segmentation dataset with 8K masks on MRI dicom files for MRI Guided Focused Ultrasound Surgery of Uterine Fibroids
- Develop a GUI with streamlit to allow custom model inference and a Huggingface Demo with gradio
- Win 1st place in Sunnybrook's academic poster competition

Math and Modelling Member — *Waterloo ON*

Waterloo iGEM — *Jan 2023 - Current*

- 2023 Project: Guarden - Vaccine against TSWV(Tomato spotted wilt virus) [bronze prize]
- Research and implement SIR model with Monte Carlo to simulate 100K trails of TSWV epidemic on plants
- Research and model RNA interference mechanism with TSWV mRNA

Software Lead & Hardware Member — *Waterloo ON*

Waterloo Biomechatronics - Electromyography Sensing Fabric Team — *Sept 2022 - Current*

- Design the sensor sleeves for collecting EMG data with Wifi on a ESP32
- Using FFT, filters and LightGBM to process EMG signals and predict hand gestures in real-time. Model achieve 95% acc and 96 F1 score

Projects

Breast Tumour Segmentation

Personal — *Apr 2023 - June 2023*

- Segmentation task for breast tumour ultrasound images using Unet, Segformer, Yolov8 and Segment Anything with 92-98% dice score

Brain Tumour Classification & Segmentation

Personal — *Feb 2023 - Mar 2023*

- Achieve 98% accuracy on image classification task with Transfer Learning from EfficientNet
- Achieve 96 mean dice score on image segmentation with Unet

Face Recognition and Object Detection Door-lock

Personal — *Dec 2022 - Current*

- Using Siamese Model, OpenCV for Face Recognition and Yolov7 to detect handheld objects
- Modelling on Solidworks for the case and gimbal to hold the Raspberry Pi , Servo and Camera Module

Stable Diffusion Implementation

Personal — *July 2022 - Current*

- Implementing and training Stable Diffusion models with different models from HuggingFace for Generative Art
- Incorporate research paper and implement state-of-the-art techniques like LoRA, Dreambooth, and ControlNet

Education

University of Waterloo — *Waterloo ON*

Biomedical Engineering with Co-op: Bachelor of Applied Sciences (Honours) Candidate — *Sept 2022 - April 2027*

- General member in Data Science Club, Anime Orchestra, and Art Club
- **Dean's honour list** | President's Scholarship of Distinction