Sanjeew Kanagaraj

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EDUCATION

The University of Hong Kong, Hong Kong *Sept 2017 - May 2021*

Bachelor of Engineering in Computer Engineering

Relevant Coursework: Computer Vision, Machine Learning, Experiential Robotics, Data Structures & Algorithms, Linux Shell & Bash, Software Engineering, OOP in Java, Raspberry Pi and Arduino projects, Networking

WORK EXPERIENCE

Robot Data *Sept 2020 – Present*

Software Engineering Intern, Artificial Intelligence Team

- Developed computer vison models for real world use cases using **Tensorflow** and **Pytorch**, optimized and deployed inference on edge devices using **Docker**, **Kubernetes**, **TensorRT** and **Nvidia Deepstream SDK**.
- Implemented real-time face mask detection along with temperature checking with precision of **over 95%.**
- Trained **U-Net** and **PraNet** image segmentation models to detect tumors in ultrasound scans, achieving **DICE accuracy of 92%.**

Hanson Robotics *June 2020 - Sept 2020*

Robotics Intern, Core Engineering Team

- Co-authored paper titled ***A Neuro-Symbolic Humanlike Arm Controller for Sophia the Robot,*** researching the use of Convolution Neural Networks coupled with symbolic AI for object grasping (https://arxiv.org/abs/2010.13983)
- Constructed kinematic **URDF** representation of robotic arms to be used in simulation of intricate movements.
- Implemented **AI behavior tree algorithms** to enable complex behavior patterns on Sophia, integrating with **the Hanson Robotics SDK.** Improved Sophia's human-robot interaction heuristics and reduced interaction delay **by 50%.**

Makerbay *Sept 2019 - June 2020*

Robotics Intern

- Led student and AI teams of the coral reef mapping robot - an open-source autonomous robot used to map coral reefs powered by the **Raspberry Pi** and **Pixhawk** boards.
- Developed data pipeline and deep learning model for coral species identification using **OpenCV**, **Pytorch** and **Google cloud**, achieving accuracy of **85%** and reducing time taken by marine biologist for annotation by up to **90%.**

Quokka Reward *March 2019 - Sept 2019*

Full Stack Web Development Intern

- Responsible for the development and testing of **REST API** to be used by more than 1000 mobile app users
- Worked with **SQL** and **Matplotlib** to implement data analytics dashboards to show effectiveness of the platform.

SELECTED PROJECTS

- **Lidar based object detection:** Classification of LIDAR point clouds using the ZCU102 FPGA board. *Python, ML*
- **RecycleBot:** Raspberry Pi powered robot used to classify different types of recyclable material. Leverages YOLO-v5 network trained with custom data to identify and move item to appropriate bin. *Python, C++, ROS, PyTorch, Arduino,*
- **Federated Learning in Robots:** Currently prototyping federated learning on a robot to enable human interaction. Combines NLP and computer vision. *Tensorflow, Networking, Control*
- **Tiler:** Tile based puzzle game with progressively harder levels, built with OLC Pixel game engine. *C++, OOP, STL*

SKILLS

Languages: Python, C++, C, Java, Javascript, Bash

Frameworks and Tools: Pytorch, TensorFlow, OpenAI, Keras, OpenCV, Django, ROS, Docker, Kurbenetes, Git, Linux

AWARDS & RECOGNITION

- **Leader of interdisciplinary university funded team** of 20 students researching **advanced underwater robotics.**
- **Awarded funding by the Gallant Ho Fund** to lead a team of 12 HKU students on an experiential learning trip to the Philippines to test the coral reef mapping robot, held in partnership with University of the Philippines.
- Awarded **HKU Foundation Scholarship** covering tuition upon admission.
- Member of **HKU Robocon team** currently working on autonomous archery robots