

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 – Dec 2020

Software Engineering Intern, Artificial Intelligence Team

- Developed computer vision models for real world use cases using **Tensorflow** and **Pytorch**, optimized and deployed inference on **edge devices** using **Docker**, **TensorRT** and **Nvidia Deepstream SDK**.
- Implemented **real time face mask detection** in conjunction with temperature checking with **precision of over 95%**.
- Setup machine learning pipeline using **Kubernetes** and **Kubeflow** to streamline data pre-processing and model creation, **improving efficiency by 40%**.

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; built using **Python** and **Django**.
- Worked with **SQL** and **Matplotlib** to implement **data analytics dashboards** to show effectiveness of the platform.

RELEVANT PROJECTS

- RecycleBot - Python, C++, ROS, PyTorch, Arduino, PID**
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.
- Federated Learning in Robots – Tensorflow, Networking, Control**
Currently prototyping federated learning on a robot to enable human interaction. Combines NLP and computer vision.
- Game - C++, OOP, STL**
Tile based puzzle game with progressively harder levels, built with OLC Pixel game engine.

SKILLS

Languages

Python, C++, C, Java, Bash, Javascript

Frameworks and Tools

Pytorch, TensorFlow, OpenAI, Keras, OpenCV, Django, ROS, Docker, Kubernetes, Git, Linux

SELECTED ACHIEVEMENTS

- 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**.