Tariq Soliman

+614 23 696 614| t.soliman@uq.net.au | linkedin.com/in/tariq-soliman/ | linktr.ee/tariqsoliman

EDUCATION

The University of Queensland (UQ) St Lucia, QLD
Bachelor of Engineering (Hons) and Master of Engineering, Major in Mechatronics *Feb. 2019 – Nov. 2024*
6.82 GPA

National University of Singapore (NUS) Singapore
Exchange Program *Aug. 2022 – Feb. 2023*

Westpac Singapore
W100 Asian Exchange Scholar & Leadership Development Program *Sep. 2022*

EXPERIENCE

Undergraduate Digital Engineer Jan. 2024 – Present
Hatch *Brisbane, QLD*

- Researching applications of drones with computer vision for asset monitoring and predictive maintenance
- Implementing a combination of deep learning and traditional computer vision techniques for locating concrete pillars and segmenting surface voids
- Implementing Visual Simultaneous Localisation and Mapping in ROS2 with RGB camera for autonomous path planning

Tutor Mar. 2019 – Present
The University of Queensland, ITAR, Cluey Learning & Privately *St Lucia, QLD*

- UQ Courses: Programming for Engineers, Introduction to Computer Systems
- For the Indigenous Tutorial Assistance and Retention (ITAR) program, online for Cluey Learning, privately for high school students
- Lead tutor for courses at UQ. Responsibilities included running tutorials and presenting technical content, training new tutors, helping students with assignments, helping course coordinators draft assessments, helping to write tests for code, marking assessments

Research Assistant Dec. 2022 – Feb. 2023
Singapore Sports Institute *Singapore*

- Implemented a custom deep learning model in keras that could classify a subset of fencing movements based on data from four Inertial Measurement Units
- Collected data from seven athletes for training the model and achieved 75-80% accuracy on windows of data from an eighth unseen athlete
- Developed an application with a GUI in PyQt (Qt for Python)

First Year Engineering Student Mentor Feb. 2022 – Apr. 2022
The University of Queensland *St Lucia, QLD*

- Welcomed new engineering students to UQ and helped to answer questions about starting university
- Encouraged engagement in university life and cultutre

Research Assistant Nov. 2021 – Feb. 2022
The University of Queensland *St Lucia, QLD*

- Helped to develop the GUI for a MacOS app for sonification of astronomical surveys (like Google Maps for space with sound)
- Used SwiftUI and helped modify a Javascript library that used JQuery for the surveys

PROJECTS

Pose Detection with Pretrained ViTs | *Python, PyTorch*   Feb. 2023 – June 2023
- Performed transfer learning on ViTs pretrained using DINO, MAE and MSN methods inspired by the paper *ViTPose: Simple Vision Transformer Baselines for Human Pose Estimation*
- Training with the COCO Keypoints dataset led to 0.847 $AP_{.5}$ and 0.569 $AP_{.5:.95}$
- Presented a live inference demonstration using the top-down approach with YOLO for detecting people
- Visualised attention maps

Admin App for Tutoring Business | *React, Expo (React Native), Typescript, Firebase*   Jan. 2021 – March 2024
- Developing a mobile app that allows tutors to report their hours
- Developing a web app interface for admin

Robotics Projects | *Python, ROS2, C, C++, Keras, Embedded Programming*   Feb. 2019 – Present
- Designed and manufactured a robot that can find the centre of a test area and shoot infra-red targets with a laser pointer
- Implemented an IoT robot that could turn to face people by recognising their shoes
- Used ROS2 to program a robot to perform Simulataneous Localisation And Mapping (SLAM) with autonomous path planning in order to map and explore an unseen test area

Misc. Projects | *Verilog, Vivado, Assembly (ARM), Solidity, React, Javascript* Aug. 2022 – Dec. 2022

- Implemented parts of an ARM processor at RTL level with verification on an FPGA
- Created a multisignature wallet on the blockchain with Solidity with a web app interface
- Created a personal blog to share things I am learning about.
- Completed Advent of Code 2023 with all 50 stars in C++

TECHNICAL SKILLS

Languages: Python, C, C++ (modern), JavaScript, TypeScript, Bash, Matlab, Swift, Lua, Verilog, Assembly (AVR & ARM), Solidity
Frameworks: React, Expo (React Native), Node.js, PyTorch, Tensorflow (with keras), ROS, PyQt, Simulink, FreeRTOS, Firebase
Developer Tools: Git, Linux, Azure, (Neo)Vim, i3wm, VS Code, Vivado, Jupyter Notebook, Jira, Latex
Libraries: Pandas, NumPy, Matplotlib, SciPy, scikit-learn, scikit-image, OpenCV (Python), huggingface, ultralytics
Misc. Skills: Altium (PCB design), Solidworks (CAD), ANSYS (FEA), Circuit Analysis, Signal Processing, PID Control, State Space Modelling, Non-linear Control with Lyapunov Functions, Analysis of MDOF Systems, Modal Analysis, Systems Theoretic Process Analysis (STPA)