Ma Yuchen (Kevin)

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EDUCATION

Singapore University of Technology and Design (SUTD)   **Singapore**
Bachelor of Engineering (Engineering Product Development), Honours   May 2019 - Sep 2022
- Focused track: Robotics. Expected to graduate with a Minor in Information Systems
- Cumulative GPA: 5.12/5.0 (expected Honours with Highest Distinction)
- Keppel Awards of Excellence: Top 2 Best Overall Year-one Student
- Best Student of subjects *Advanced Math II*, and *Modelling the Systems World*
- Full Scholarship awarded by Sembcorp Industries to Top 5% students from high schools in China

WORK EXPERIENCES

Temasek Aerial Innovation & Research Laboratory @ SUTD   **Singapore**
Undergraduate Research Assistant   Sep 2020 - Present
- Set up PX4 flight controller with ROS2. Create plugins to simulate communications between drones in simulator (Gazebo).
- Build a quadrotor drone with multiple sensors including lidar, depth camera, etc. from scratch. Set up off-board control and test inter-drone communication and multi-drone planning algorithms.

Open Robotics   **Singapore**
Software Engineering Intern   May 2020 - Sep 2020
- Created a demo environment in simulator (Gazebo), which features a building with three levels and two functional lifts, to showcase the traffic control of heterogeneous robot fleets across multiple levels in a building with the Robotics Middleware Framework (RMF). Developed critical features in the RMF core library to enable path planning and negotiation across multiple levels and lift session management.
- Developed the generation of lift cabin and door models according to map annotations as part of the existing simulation world generation pipeline. Developed a robust plugin to control the lift in simulation and interface with RMF, supporting both Gazebo and Ignition.
- Developed various features in the traffic map editing GUI, robot traffic visualization tool, and simulation plugins in C++ and Python3. Greatly enhanced the usability and accessibility of the existing development tools. Merged 14 Pull Requests in corresponding GitHub repositories.
- Worked closely with colleagues in systematic testing and debugging for new features by writing unit tests with Catch2. Recognised critical bugs in major release candidates and assisted in resolving them. Wrote detailed documentations for features developed and bugs discovered allowing easier collaborations.

Yijiahe Technology Co., Ltd (A high-class provider of robot technology solutions for special industries in China)   **Nanjing, China**
Intern, Junior C++ Engineer   Dec 2019 - Jan 2020
- Developed a ROS node that records the operation time information of an electricity maintenance robot using C++ and SQLite.
- Collated the ROS system structure and information flow of the electric maintenance robot for future re-designing of the system architectures.

AutoCore Intelligent Technology Co., Ltd (A start-up devoted to affordable intelligent vehicle platforms)   **Nanjing, China**
Intern, Assistant Deep Learning Engineer   Aug 2019 - Sep 2019
- Wrote a data augmentation algorithm with Python and OpenCV for deep learning dataset expansion and performed data augmentation on a data set of over 4,000 images.
- Performed dataset creation with data augmentation and YOLO object recognition model training for traffic light and parking lot detection for self-driving cars with more than 95% accuracy.

ACADEMIC PROJECTS

Singapore University of Technology and Design   **Singapore**
3D Printing Failure Detection Project, Student Researcher   Dec 2019 - Present
- Developing a vision-based 3D printing failure detection system by integrating traditional Computer Vision method and Deep Learning method using OpenCV and YOLO. Achieved an overall accuracy of over 90% by fine tuning parameters through experiments.
- Collaborating with project partner in designing a novel workflow for automatic 3D printer controlling and workpiece collection with industrial robotics arm. Enhancing bash scripts for detection and printer control pipeline.
- Actively involved in literature review and research paper writing for the project.

Thor Project, Student Researcher

Jun 2019 - Jan 2020

- Implementing Reinforcement Learning with Gym and Ray for a one-metre-wide transformable dual-rotor aerial craft controlling system model training to get a working controlling system that is able to stabilise the aerial craft in a range of 2 m^3.
- Simulating and visualising the flying trajectory of the aerial craft with PyBullet to analyse the result of the training.

REMATCH Project, Chief Software and Electrical Engineer

Oct 2019 - Dec 2019

- Built an arcade game console that allows users to play Pong game with rope-pulling exercise as a product for the course 3.007-Introduction to Design.
- Single-handedly designed the electronics system architecture that features modularity and maintainability. Built highly sensitive rotation encoders from scratch with infrared sensors and Arduinos. Developed a Pong game running on Raspberry Pi with clear UI using Python 3.
- Went through detailed design process in a team of five to optimise user experience, functionality and aesthetics of the product.

CO-CURRICULAR ACTIVITIES

SUTD Organisation of Autonomous Robotics (SOAR)

Singapore

Secretary

Jun 2019 - Present

- Work closely with an Executive Committee of 7 individuals to lead the organisation of about 70 members. Plan for weekly sessions of the club and external events and keeping track of club logistics. Process documents required for activities and log down meeting notes, manage and update the club's folders, documents and records.
- Worked as event organizer and workshop facilitator for SUTD BuildSomething 2019, a week-long SolidWorks & Arduino workshop course, with the end product of a line-tracing robot.
- Improved the skills and proficiencies of about 30 members of the club by organizing series of workshops that cover robotics and other technical concepts (SolidWorks, Arduino, PID, Git, Linux, and ROS).

RoboClash 2021, Organising Committee

Sep 2019 - Present

- Collaborate with other committee members in holding SUTD's biggest annual internal robotics competition. Liaised with external sponsors and relative school departments to ensure the smooth operation of the competition.
- Developed an object detection and measurement programme utilising Raspberry Pi and OpenCV as a part of our novel IoT scoring system. Co-designed and fabricated a 36 m^2 arena out of plywood and extruded aluminium profiles.

SOCIAL VOLUNTARISM

Tanjong Pagar Community Club Youth Executive Committee Soccer Team

Singapore

Event Organiser

Aug 2019

- Organised a team bonding event for more than 80 team members and received positive feedback from attendees.
- Collaborated directly with the Ministry of Education (Singapore) to engage the new scholars by giving speeches and conducting sharing sessions for scholars.

ADDITIONAL INFORMATION

- Technical Skills:
  Python, C/C++, ROS/ROS2, Gazebo/Ignition, Arduino, OpenCV, Linux & Bash script, TensorFlow, SQL, Java, JavaScript, MATLAB, SolidWorks (with CSWA Certification), Fusion360

- Language Proficiency:
  - English written and spoken (Fluent)
  - Mandarin written and spoken (Native)