WeiQin Chuah

Portfolio: linkedin.com/weiqin
Github: github.com/weiqin

Email: weiqin5645@gmail.com
Mobile: +61 424 095 691

About me

A self-motivated and enthusiastic final-year PhD candidate at RMIT University, Australia. Research interests include machine learning, computer vision, autonomous navigation, and robotics. Current research focuses on synthetic-to-realistic domain generalization for deep learning-based computer vision problems such as stereo matching, optical flow and semantic segmentation. The developed systems will be highly beneficial for real-life applications such as autonomous driving, robotics, augmented reality and more.

Education

- **Royal Melbourne Institute of Technology (RMIT)** — Melbourne, Australia
  PhD - Mechanical, Manufacturing and Mechatronics Engineering — *Feb 2019 - Current*
  (Expected to graduate in December 2022)
- **Royal Melbourne Institute of Technology (RMIT)** — Melbourne, Australia
  Bachelor of Engineering (Adv. Manufacturing and Mechatronics) (Honours). [GPA: 3.7] — *Mar 2014 - Nov 2018*
- **Monash College** — Melbourne, Australia
  Monash University Foundation Year (MUFY). [WAM: 83.0] — *Jan 2012 - Oct 2012*

Skills Summary

- Languages: Python, C++, MATLAB, Bash
- Frameworks: Pandas, Scikit, OpenCV, TensorFlow, Keras, PyTorch
- Tools/Software: Docker, GIT, Jupyter, Carla, CATIA, Solidworks
- Platforms: Linux, Windows, macOS, Arduino, AWS

Publications

- **An Information-Theoretic Method to Automatic Shortcut Avoidance and Domain Generalization for Dense Prediction Tasks**
  Submitted to IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI) 2022
  WQ Chuah, R Tennakoon, R Hoseinnezhad, A Bab-Hadiashar, D Suter

- **ITSA: An Information-Theoretic Approach to Automatic Shortcut Avoidance and Domain Generalization in Stereo Matching Networks**
  IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2022
  WQ Chuah, R Tennakoon, R Hoseinnezhad, A Bab-Hadiashar, D Suter

- **Semantic Guided Long Range Stereo Depth Estimation for Safer Autonomous Vehicle Applications**
  IEEE Transactions on Intelligent Transportation Systems (T-ITS) 2022
  WQ Chuah, R Tennakoon, R Hoseinnezhad, D Suter, A Bab-Hadiashar

- **Deep Learning-Based Incorporation of Planar Constraints for Robust Stereo Depth Estimation in Autonomous Vehicle Applications**
  IEEE Transactions on Itelligent Transportation Systems (T-ITS) 2021
  WQ Chuah, R Tennakoon, R Hoseinnezhad, A Bab-Hadiashar

- **Machine Vision-Enabled Traffic Controller for Safer and Smoother Traffic Flow Around Construction Sites**
  IEEE Intelligent Transportation Systems Conference (ITSC) 2019
  WQ Chuah, R Tennakoon, R Hoseinnezhad, A Bab-Hadiashar

- **State Transition for Statistical SLAM Using Planar Features in 3D Point Clouds**
  Sensors, Volume 19, Issue 1614, 2019
  AK Gostar, C Fu, **WQ Chuah**, MI Hossain, R Tennakoon, A Bab-Hadiashar, R Hoseinnezhad

Professional Experience

- **RMIT University** — Melbourne, Australia
  Mechatronics Engineering Intern (Machine Learning, Image Processing, Sensor Fusion) — *Dec 2017 - Feb 2018*
  Research and development of an intelligent cow screening and cleaning system
  - Point cloud re-projection from RGB-D images
  - 3D reconstruction via point cloud registration and stitching using iterative closest point
  - Sensor fusion using data collected from thermal sensor and RGB-D cameras
  - Develop a machine learning model for healthy or diseased classification
- **Aubot** — Melbourne, Australia
  Mechanical Engineer Intern (Mechanical Design) — *Apr 2017 - Oct 2017*
  Research and development of a 6 degree of freedom assistant robotic arm, Jeva
  - Design and prototyping of robotic grippers using 3D CAD modeling in Solidworks

Teaching Experience

- **Machine Learning (COSC2673)** — RMIT University
  Tutor / Lab Demonstrator — *Feb 2021 - Current*
  - This course introduces the fundamental Machine Learning concepts, covering supervised and unsupervised techniques, evaluation, as well as specific approaches such as deep neural networks.
  - Reinforce the theoretical understanding of Machine Learning concepts introduced in the lecture; and assist students with applying theory concepts into programming practice for solving a wide range of problems, using open source Machine Learning toolkits.

- **Digital Fundamentals (OENG1206)** — RMIT University
  Lab Demonstrator — *Feb 2021 - July 2021*
  - This course is focused on digital literacies for engineers and will equip the students with the ability to apply a problem-solving methodology to common engineering problems.
  - Guide students to design, write, test and debug programs to solve a variety of engineering problems using MATLAB/Simulink.

- **Mechatronics Principle (MIET2370)** — RMIT University
  Teaching Assistant — *Feb 2020 - July 2020*
  - This course introduces the principle of Mechatronics as a multidisciplinary engineering discipline that includes electronics, electrical, mechanical, computer systems engineering, together with information technology.
  - Provide students with hands-on assistance in putting theory into practice in the context of a challenging project that is at the core of a national design and build competition (NI ARC)

Projects

- **RMIT University** — Melbourne, Australia
  Wide Baseline Stereo Data Collection (Data acquisition, System Integration) — *May 2019 - April 2020*
  Real-time driving imageries data collection using multiple cameras, LiDAR and GPS sensor.
  - Software: Data acquisition using C++/Python with dedicated SDK for sensors; Sensor synchronization to minimize data misalignment; Real-time data visualization
  - Hardware: Integrating all sensors and electronics as a system on a moving vehicle
  - Data post-processing: stereo rectification and data alignment between RGB images and LiDAR points

- **RMIT University** — Melbourne, Australia
  Mechatronics Final Year Projects (Computer Vision, Robotics) — *Mar 2017 - Oct 2018*
  Development of Statistical SLAM Using Planar Features in 3D Point Clouds
  - Plane segmentation using a robust statistical estimator
  - Noises/outliers removal using RANSAC
  - Point cloud registration and map generation
  - Path planning and motion control

Extracurricular Experience

- **High Powered Rocket Team - HIVE RMIT** — Jun 2018 - Mar 2019
  Recovery Systems Team Leader
  Develop a reliable rocket recovery system to allow sufficient drag and counteract the force of gravity for minimizing the landing impact. The main tasks involve:
  - Selecting appropriate parachute dimensions and design.
  - Setting a suitable deployment mechanism.
  - Integrating multiple electronic sensors for real-time tracking of the deployed rocket.

  Our team won the first place in the Australian Universities Rocket Competition in the 30,000ft category in 2019.

- **RMIT Mates Program** — Feb 2016 - Oct 2016
  Volunteer Mentor
  Provide practical advice, social interaction and general academic guidance to newly-arrived international, regional or rural/remote students in their first semester of study at RMIT University.

- **RMIT Student Learning Advisor Mentors (SLAMs)** — Mar 2016 - Jul 2016
  Volunteer Mentor
  Provide academic advice and share strategies with students on time management and study planning to achieve outstanding results.

Referees

Available upon request.