WeiQin Chuah

LinkedIn: linkedin.com/weiqin
Github: github.com/weiqin
Webpage: https://waychin-weiqin.github.io/

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

About me

Dedicated computer vision researcher with a focus on *robustness*, *generalization*, and *fairness* in machine learning, essential for medical imaging applications. My doctoral work at RMIT University, Australia, has pivotal advancements in machine learning and computer vision, evidenced by publications in top-tier journals and conferences, such as T-PAMI (Impact Factor: 23.6) and CVPR (Core-A*). In addition to my research, I also boast a solid teaching record at RMIT, with an average GTS score of 87/100, highlighting my ability to distill complex technical concepts effectively for audiences at different levels.

Professional Experience

- **Post-Doctoral Researcher (Deep Learning, Computer Vision)** — Melbourne, Australia
  RMIT University — *Oct 2022 - Current*
  - ARC-Linkage with Ford.
  - Research and development of an intelligent and automated visual inspection system for self-piercing rivets.
- **Casual Research Officer (Deep Learning, Computer Vision)** — Melbourne, Australia
  RMIT University — *Sept 2022 - Oct 2022*
  - Collaboration with industry partner Bondi Labs Australia.
  - Research and development of an intelligent and automated visual inspection system for vet-assistive technology.
  - Developed world-first vet-assistive prototype for cattle inspection.
- **PhD (Machine Learning, Computer Vision)** — Melbourne, Australia
  RMIT University — *Feb 2019 - Sept 2022*
  - Research and development focus on creating robust algorithms for stereo matching and depth estimation in robotics and intelligent transportation systems.
- **Research Officer, *Internship* (Machine Learning, Image Processing, Sensor Fusion)** — Melbourne, Australia
  RMIT University — *Dec 2017 - Feb 2018*
  - Research and development of an intelligent system for cow screening and cleaning.
- **Mechanical Engineer, Internship (Mechanical Design)** — Melbourne, Australia
  Aubot — *Apr 2017 - Oct 2017*
  - Research and development of an assistive robotic arm to assist people with a disability and remote carers.

Teaching Experience

- **Tutoring and Learning Coordination** — Melbourne, Australia
  RMIT - School of Computing Technologies
  - Actively involved in teaching at RMIT University since 2021.
  - Courses Taught:
    - COSC2673 Machine Learning, GTS: 84.7 (2021); 87.0 (2022)
    - COSC2793 Computational Machine Learning, GTS: 78.8 (2021)
    - COSC2779 Deep Learning (Undergraduate), GTS: 97.2 (2022)
    - COSC2779 Deep Learning (Postgraduate), GTS: 88.1 (2022)
  - Key Responsibilities:
    - Assessed and provided personalised feedback on student projects and assignments, significantly enhancing learning outcomes.
    - Conducted both theoretical and practical classes, utilising a blend of tutorials, hands-on lab sessions, and real-time Q&A to boost learning comprehension.
    - Applied diverse teaching methodologies to cater to a varied student demographic, improving course engagement and satisfaction.
- **Capstone Project Supervision** — Melbourne, Australia
  RMIT - School of Engineering
  - Mentored an undergraduate and a master's student to successful completion of their capstone projects, both of which contributed substantively to advancements in automated system technologies.
- **Research Tutorial / Workshop** — Melbourne, Australia
  RMIT - School of Engineering / School of Computing Technologies
  - Conducted workshops and tutorials on current research trends, delivering insights on specialised topics to engage PhD students and faculty members actively involved in related research areas.

Publications

- **Enhanced Online Test-time Adaptation with Feature-Weight Cosine Alignment**
  Under Review in European Conference on Computer Vision (ECCV) 2024 (Core-A)*
  WQ Chuah, R Tennakoon, A Bab-Hadiashar

- **Single Domain Generalization via Normalized Cross-correlation Based Convolutions**
  IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2024 (Core-A)
  WQ Chuah, R Tennakoon, R Hoseinnezhad, D Suter, A Bab-Hadiashar

- **An Information-Theoretic Method to Automatic Shortcut Avoidance and Domain Generalization for Dense Prediction Tasks**
  IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI) 2023 (Q1)
  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 (Core-A)*
  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 (Q1)
  WQ Chuah, R Tennakoon, R Hoseinnezhad, D Suter, A Bab-Hadiashar

- **Towards Building a Vet-Assist System: Animal pose estimation and counting walking steps**
  Australasian Conference on Robotics and Automation (ACRA) 2022
  WQ Chuah, A Bab-Hadiashar, R Tennakoon, F Zambetta, R Hoseinnezhad, J Hall, J Marshall, S Smith, M Stevenson

- **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 (Q1)
  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

- **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

Education

- **Royal Melbourne Institute of Technology (RMIT)** — Melbourne, Australia
  PhD (School of Engineering) — *Feb 2019 - Oct 2022*
  Thesis: Passive visual depth estimation in the deep learning era.

- **Royal Melbourne Institute of Technology (RMIT)** — Melbourne, Australia
  BSc (Engineering), Adv. Manufacturing and Mechatronics (First Class Honours) — *Mar 2014 - Nov 2018*

Projects

- **RMIT University** — Melbourne, Australia
  Wide Baseline Stereo Data Collection (Data acquisition, System Integration) — *May 2019 - April 2020*
  - Led a team in the real-time collection of driving imagery using an integrated system comprising multiple cameras, LiDAR, and GPS sensors, enhancing data acquisition and system integration for autonomous driving research.

- **RMIT University** — Melbourne, Australia
  Mechatronics Final Year Projects (Computer Vision, Robotics) — *Mar 2017 - Oct 2018*
  - Developed a Statistical SLAM algorithm using planar features in 3D point clouds, advancing computer vision and robotics through innovative mapping and localization techniques.

Skills Summary

- **Languages**: Proficient in Python, C++, MATLAB
- **Data Science & Machine Learning**: Experienced with Pandas, Scikit-learn; Adept in deep learning frameworks including TensorFlow, Keras, PyTorch
- **Computer Vision**: Skilled in implementing and optimizing algorithms with OpenCV
- **Communication**: Effective in verbal and written communication; experienced in delivering presentations to various audiences.
- **Collaboration**: Demonstrated success in industry collaboration and working in team environments

Extracurricular Experience

- **High Powered Rocket Team - HIVE RMIT** Jun 2018 - Mar 2019

  Led the Recovery Systems Team to develop and integrate software and electronic hardware for rocket recovery systems, creating sufficient drag and counteraction against gravity, ensuring minimal landing impact. Secured first place in the 30,000ft category at the Australian Universities Rocket Competition in 2019.

- **RMIT Mates Program** Feb 2016 - Oct 2016

  Served as a Volunteer Mentor, providing practical advice, fostering social interaction, and offering academic guidance to support the transition of international and rural students during their first semester.

- **RMIT Student Learning Advisor Mentors (SLAMs)** Mar 2016 - Jul 2016

  Contributed as a Volunteer Mentor, delivering academic advice and sharing effective time management and study strategies with peers to enhance their academic performance.

Referees

Available upon request.