

Ultra-Fine-Grained Robotic Vision and Explaining Deep Machine Vision Models

Speaker: **Prof. Yongsheng Gao**
Griffith University, Australia

Date: Nov. 26th, 2025

Time: 10:00-11:00

Venue: Seminar room 1, 4F, East-Wing, BKC Campus,
Ritsumeikan Univ., Noji-Higashi 1-1-1, Kusatsu



Abstract:

Artificial intelligence and machine learning have achieved remarkable performance in extensive robotic vision tasks such as object classification and detection. Such superior performances, however, heavily rely on a very large scale of labeled data for training, which in practice is often expensive and infeasible to obtain. Ultra-fine-grained image recognition and visual explanation of decision-making evolution inside a deep machine vision model remains challenging open problems in the research community. This talk will introduce our effort towards bridging this gap, i.e., enabling image classification of very similar objects and when only few examples are available, and explaining internal attention flow of machine vision models. Some recent works such as ultra-fine-grained visual classification beyond human performance, deep models for very similar object recognition, and attention flow will be discussed.

Biography:

Professor Yongsheng Gao is the Director of Australian Research Council (ARC) Industrial Transformation Research Hub for Driving Farming Productivity and Disease Prevention, and the recipient of 2025 Industry Laureate Fellow. He was a member of College of Experts, Australian Research Council, and Director of Institute for Integrated and Intelligent Systems, Griffith University. He made significant contributions to both fundamental theories and applied research that has solved important industrial problems. Their recent international recognitions include Impactful Research Team of the Year for 2024, Triple E Awards (Entrepreneurship and Engagement Excellence Awards in High Education); Innovation and Entrepreneurship Team of the Year–Rising Star for 2023, Global Triple E Awards; Special Commendation for Promoting Industry Engagement in Graduate Research (2022), Australian Council of Graduate Research Excellence Award.

He continually publishes in the prestigious journals and conferences in his discipline, including IEEE Transactions on Pattern Analysis and Machine Intelligence, International Journal of Computer Vision, IEEE Transactions on Image Processing, IEEE Transactions on

Neural Network and Learning Systems, IEEE Transactions on Medical Imaging, IEEE Transactions on Circuits and Systems for Video Technology, Pattern Recognition, IEEE Transactions on Geoscience and Remote Sensing, IEEE Transactions on Information Forensics and Security, The International Conference on Computer Vision, International Joint Conference on Artificial Intelligence, The AAAI Conference on Artificial Intelligence, IEEE International Conference on Computer Vision and Pattern Recognition. As a Chief Investigator, he has been working on projects in Australia, Singapore, Germany, and China in the areas of smart farming, environmental informatics, image analysis, computer vision, pattern recognition, medical imaging, and face recognition. He was also employed as a consultant by Panasonic Singapore Laboratories Pte Ltd working on the face recognition standard in MPEG-7. His works were reported in the media in Australia and Singapore, including The Australian, The Courier Mail, The Sydney Morning Herald, and The Straits Times (Singapore).

Website: <https://experts.griffith.edu.au/19112-yongsheng-gao>