Xiaohaoyang Lei

xlei0009@student.monash.edu | Suzhou, China / Melbourne, Australia | Google Scholar

Research Interests

Computer vision and affective computing (emotion recognition), deep learning, and the application of machine learning to scientific and engineering data. My background spans both data science and electronic / semiconductor systems, from AI research to RF modules and device measurement, which supports work across the software–hardware boundary.

Education

2025 – present **M.Sc. Data Science**
Monash University, Australia.
Current WAM: 70/100 (Distinction average; UK 2:1 equivalent).

2022 – 2024 **B.Eng. Electrical Engineering and Electronics (2+2 Joint Programme)**
University of Liverpool, United Kingdom.

2020 – 2022 **B.Eng. Telecommunications Engineering (2+2 Joint Programme)**
Xi'an Jiaotong–Liverpool University, China.

Research & Professional Experience

Research

2025 – present **Research Assistant, Southeast University (China)–Monash University Joint Graduate School, Suzhou.**

2022 – 2023 **Research Assistant, Nano-Micro Fabrication Laboratory, Xi'an Jiaotong–Liverpool University, China.**

Teaching

2025 – present **Teaching Assistant, Southeast University (China)–Monash Joint Graduate School, Suzhou.**
Courses: FIT5047 Fundamentals of Artificial Intelligence; FIT5201 Machine Learning; FIT5217 Natural Language Processing.

- Supported tutorials, consultations, technical explanations and assignment interviews across AI, machine learning and NLP.
- Assisted marking with consistent rubrics and gave feedback on modelling, data and programming work.

Industry

2024 **Trainee Engineer Intern, BEHOME.**

- Developed and tested IoT RF modules (Zigbee Ember / TI, LoRa base-station / patch) and an emergency-broadcast application; designed test PCBs, soldered components and documented results.

Research Publications

[*] *Co-first author.*

Journal Articles

1. Y. Zhu, H. Su, F. Li, A. Li, **X. Lei**, M. Cui, W.-C. Lai, H. Wen, and W. Liu, "A 35 V–5 V monolithic integrated GaN-based DC–DC floating buck converter," *Semiconductor Science and Technology*, vol. 38, p. 095 001, 2023.

Conference Proceedings

1. K. Cheng, **X. Lei**[*], R. Wang, H. Li, and C. Chen, "BlendEmo: Structured set prediction and pair-conditioned ratio modeling for blended emotion recognition," in *Proceedings of the 2026 IEEE International Conference on Automatic Face and Gesture Recognition (FG)*, Accepted, 2026.
2. **X. Lei**, "Review on the FPGA design optimization for ASIC," in *International Conference on Software Engineering and Machine Learning (ICSEML)*, vol. 4, 2023, pp. 524–531.
3. **X. Lei**, K. Ma, and J. Zhao, "R2I: A deep fault diagnosis semantic segmentation system based on knowledge distillation in photovoltaic panels," in *International Conference on Energy, Power and Electrical Engineering (IEEE-EPEE)*, 2023.

Honours & Awards

2026 **Oral Presentation**, IEEE International Conference on Automatic Face and Gesture Recognition (FG).
For the oral presentation of blended emotion recognition research.

2023 **Oral Presentation**, IEEE International Conference on Energy, Power and Electrical Engineering (IEEE-EPEE).
For the oral presentation of computer-vision research.

2022 **Best Poster Award**, International Forum on Wide Bandgap Semiconductors (IFWS).
For research on wide-bandgap semiconductor devices.

Research Projects

Manuscripts in Preparation

Accepted and Published Projects

2025 – 2026 **BlendEmo: Blended Emotion Recognition**.
Computer vision and affective computing project on recognising blended facial emotions.

- Studied the hierarchical prediction problem: single/mixed expression detection, emotion-pair recovery and relative-salience estimation.
- Contributed to a structured set-prediction and pair-conditioned ratio-estimation framework with task-consistent decoding.
- Analysed five-fold cross-validation and ablation results to diagnose multimodal features, structured priors and salience-estimation bottlenecks; prepared figures, manuscript text and oral-presentation materials for a co-first-author paper accepted at IEEE FG 2026.

2023 **R2I: Photovoltaic Panel Fault Diagnosis via Knowledge Distillation**.
Deep-learning project on semantic segmentation for automatic photovoltaic-panel fault diagnosis.

- Designed a RGB-to-infrared knowledge-distillation framework using a RGB U-Net teacher and lightweight infrared student supervised by hard labels and soft teacher targets.
- Built and evaluated the segmentation pipeline with average precision and mean IoU; implemented mask-based defect-area estimation for severity assessment.
- Led problem framing, literature review, experiments, manuscript writing and conference presentation for a first-author paper published at IEEE-EPEE 2023.

2022 – 2023 **GaN-based DC–DC Floating Buck Converter**.
Monolithic-integrated 35 V–5 V GaN power converter (semiconductor device research).

- Supported D/E-mode GaN MIS-HEMT device characterisation and floating-buck converter measurement through data organisation and result checking.
- Processed experimental results in Origin and prepared figures documenting device curves, 35 V–5 V conversion, pre-driver behaviour and chip-level integration.
- Contributed to manuscript preparation as part of a collaborative semiconductor-device research team; co-authored journal article published in *Semiconductor Science and Technology* (2023).

Skills

Programming	Python (PyTorch, Pandas, NumPy, scikit-learn), SQL, C/C++, Verilog HDL, LaTeX.
Machine Learning & Data	Deep learning and computer vision, data cleaning and analysis, experimental evaluation; Spark, Origin.
Scientific Computing & EDA	MATLAB/Simulink, LTspice, Multisim, ADS, Altium Designer, Intel Quartus II.
Visualisation	Matplotlib, Origin, Power BI, Tableau; publication-quality figures.
Research	Literature review, experimental design, technical writing and academic presentation.
Languages	English (professional), Mandarin Chinese (native).