Lei Wang

Research Fellow · Visiting Scientist · Computer Scientist

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I am a hardworking, passionate, and self-disciplined researcher.

Lei Wang currently holds the position of Research Fellow at ANU, serves as a Visiting Scientist at Data61/CSIRO, and is also employed as a Computer Scientist with Active Intelligence Australia Pty Ltd. Since 2018, he has worked as a Computer Vision Researcher with iCetana Pty Ltd. In the past, he served as a Visiting Researcher at both Data61/CSIRO and UWA.

Research Interests: action recognition in videos | anomaly detection | video image processing | one- and few-shot learning | deep learning | tensor learning | domain adaptation

Education

Doctor of Philosophy (PhD), Computer Science, *The Australian National University (ANU)* *2019/07-2023/12*

Master of Professional Engineering, Software Engineering, *The University of Western Australia (UWA)* *2016/02-2018/03*

Experience

Research Fellow (Level B) | ANU College of Engineering, Computing and Cybernetics *2023/02-present*

Visiting Researcher, Postgraduate research student, Visiting Scientist | CSIRO's Data61, Australia *2018/09-present*

Computer Scientist | Active Intelligence Australia Pty Ltd, Perth, Australia *2021/07-present*

Machine Learning Researcher | Ebenezer Technologies, Barranquilla, Colombia *2020/09-2021/01*

Visiting Researcher | Department of Comput. Sci. and Softw. Eng., UWA, Perth, Australia *2018/10-2019/10*

Computer Vision Research Intern, Computer Vision Researcher | iCetana Pty Ltd, Perth, Australia *2018/07-2020/09*

Research Projects & Funding

- **Lead Chief Investigator (Lead CI)**, Robust anomaly detection in human-centric videos. The NCI **National AI Flagship Merit Allocation Scheme**, 2024/01/01-2024/06/30
- **Co-Investigator (Co-I)**, Review of Xailient's technical pipeline of facial recognition. **A$ 50,815**, 2023/10/30-2023/12/22
- **Chief Investigator (CI)** / **Delegated lead CI**, Towards building general-purpose multimodal foundation models. NCI Adaptater Scheme Q4 2023 (**HPC funding scheme**), 2023/10/01-2023/12/31
- **Grant / Project Award** (Oracle Cloud credits award), Automatic, large-scale screening of failure cases in autonomous driving. **A$ 48,000**, 2023/07/26-2024/07/25
- **Co-Investigator (Co-I)**, Sharing early insights for more resilient communities. **A$ 71,089**, 2023/04/19-2023/10/31
- **Research sponsorship** (Active Intelligence Corp.), **Principal Investigator / Project Lead**, "Human-related anomaly detection in surveillance videos (round 2)", **A$ 60,060**, 2022/07/01-2023/06/30
- **Research sponsorship** (Active Intelligence Corp.), **Principal Investigator / Project Lead**, "Human-related anomaly detection in surveillance videos", **A$ 123,368**, 2021/07/01-2022/06/30

Teaching

Teaching Assistant | Department of Comput. Sci. and Softw. Eng., UWA *2018/03-2018/07*

- CITS5508 Machine Learning
- Unit Coordinator(s): A/Prof. Du Huynh & Prof. Mark Reynolds

Recognition & Honors

- **The Sang Uk Lee Best Student Paper Award**, ACCV 2022, 2022/12/08
- **The Incentive Unit Award**, Active Intelligence Corp., 2022/09/09-2032/09/08
- **Outstanding Reviewer Award**, ECCV 2022, 2022/10/19
- **Data61 Top-up Scholarship**, Data61/CSIRO, 2019/07/01-2023/06/30
- **Data61 PhD Scholarship**, Data61/CSIRO, 2019/07/01-2023/06/30
- **ANU HDR Fee Remission Merit Scholarship**, ANU, 2019/07/01-2023/06/30
- **Outstanding Graduate Award**, Yangzhou University, 2015/06
- **Jingwen Zhu Scholarship**, Yangzhou University, 2015/03
- **Principal's Scholarship (First Class)**, Yangzhou University, 2014/12

- **The Second Prize of Lanqiao Cup Competition (C/C++ Program Design)**, National Software and Information Technology Professional Talent Competition, 2014/04
- **Principal's Scholarship (Second Class)**, Yangzhou University, 2013/12

Professional Service

- Area Chair: ACM Multimedia 2024, ICPR 2024
- Reviewer:
  Journals: TPAMI, IJCV, TCSVT, TMM, PR, CVIU, NCAA, JVCI, SIVP, TVCJ, IET Computer Vision, Electronics Letters
  Conferences: ICLR 2023-2024, AAAI 2022-2024, NeurIPS 2022-2023, ICML 2022-2023, CVPR 2022-2023, ICCV 2023, ECCV 2022, WACV 2024, BMVC 2020-2023, IEEE CAI 2023
  Workshops: The AI City Challenge Workshop (CVPR 2023), Vision Datasets Understanding (CVPR 2022-2023), Deep Vision Workshop (CVPR 2020)

Invited Talk

- Action Recognition: Past, Present and Future | Department of Computer Science, Harbin Institute of Technology | 2023/08/12

Publications

- Conference/journal papers
  [c9] – **Lei Wang**, Piotr Koniusz, Tom Gedeon, and Liang Zheng. "Adaptive Multi-head Contrastive Learning." Submitted to *International conference on learning representations.* 2023. A*
  [j4] – **Lei Wang**, Jun Liu, Liang Zheng, Tom Gedeon, and Piotr Koniusz. "Meet JEANIE: a Similarity Measure for 3D Skeleton Sequences via Temporal-Viewpoint Alignment." Submitted to *International Journal of Computer Vision.* 2023. IF: 19.5
  [c8] – **Lei Wang**, Piotr Koniusz, and Ke Sun. "High-order Tensor Pooling with Attention for Action Recognition." Submitted to *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP).* IEEE, 2023. B
  [c7] – **Lei Wang** and Piotr Koniusz. "Flow Dynamics Correction for Action Recognition." Submitted to *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP).* IEEE, 2023. B
  [c6] – **Lei Wang** and Piotr Koniusz. "3Mformer: Multi-order Multi-mode Transformer for Skeletal Action Recognition." *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition.* 2023. A*
  [c5] – **Lei Wang** and Piotr Koniusz. "Uncertainty-DTW for Time Series and Sequences." *European Conference on Computer Vision.* Cham: Springer Nature Switzerland, 2022. A*, oral
  [c4] – **Lei Wang** and Piotr Koniusz. "Temporal-Viewpoint Transportation Plan for Skeletal Few-shot Action Recognition." *Proceedings of the Asian Conference on Computer Vision.* 2022. B, oral, **Best Student Paper Award**
  [j3] – Zhenyue Qin, Yang Liu, Pan Ji, Dongwoo Kim, **Lei Wang**, R.I. (Bob) McKay, Saeed Anwar, and Tom Gedeon. "Fusing Higher-Order Features in Graph Neural Networks for Skeleton-Based Action Recognition." *IEEE Transactions on Neural Networks and Learning Systems* (2022). IF: 14.255
  [c3] – **Lei Wang** and Piotr Koniusz. "Self-supervising Action Recognition by Statistical Moment and Subspace Descriptors." *Proceedings of the 29th ACM international conference on multimedia.* 2021. A*
  [j2] – Piotr Koniusz, **Lei Wang**, and Anoop Cherian. "Tensor Representations for Action Recognition." *IEEE Transactions on Pattern Analysis and Machine Intelligence* 44.2 (2021): 648-665. IF: 24.314
  [c2] – **Lei Wang**, Piotr Koniusz, and Du Q. Huynh. "Hallucinating IDT Descriptors and I3D Optical Flow Features for Action Recognition with CNNs." *2019 IEEE/CVF International Conference on Computer Vision*, IEEE Computer Society, 2019. A*
  [j1] – **Lei Wang**, Du Q. Huynh, and Piotr Koniusz. "A Comparative Review of Recent Kinect-based Action Recognition Algorithms." *IEEE Transactions on Image Processing*, 29 (2019): 15-28. IF: 11.041
  [c1] – **Lei Wang**, Du Q. Huynh, and Moussa Reda Mansour. "Loss Switching Fusion with Similarity Search for Video Classification." *2019 IEEE International Conference on Image Processing (ICIP)*, IEEE, 2019. B, 1 AU patent
- Patents
  [p3] – **Lei Wang**. "System and Method of Detecting Anomalies from Mass Data." (US provisional, SN 63/326,525)
  [p2] – **Lei Wang** and Graeme Woods. "Method and System for Classifying Video Data." (au 2019903775, provisional patent filed 07/10/2019)
  [p1] – **Lei Wang**, Moussa Reda Mansour, and Graeme Woods. "System and Method of Video Data Retrieval." (au 2019900316, provisional patent filed 01/02/2019)
- Theses
  [t2] – **Lei Wang**. "Robust Human Action Modelling." *Ph.D. dissertation*, The Australian National University, Canberra, ACT, Australia, Nov. 2023.
  [t1] – **Lei Wang**. "Analysis and evaluation of Kinect-based action recognition algorithms." *M.S. thesis*, The University of Western Australia, Perth, WA, Australia, Nov. 2017.
- arXiv preprints
  [a1] – **Lei Wang**. "AI in Software Engineering: Case Studies and Prospects." *arXiv*, 2017, technical report.