Zheyuan (David) Liu

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Current Position

Postdoctoral Research Fellow **Adelaide, Australia**
Australian Institute for Machine Learning (AIML) *2024–current*
University of Adelaide
Advisor: Prof. Anton Van Den Hengel

- Research: Video generative models, text-conditioned video editing.
- Application-oriented experience: A screenplay-to-storyboard video generation pipeline, for minimum viable product, collaboration with in-house engineering team.

Education

Doctor of Philosophy, Computer Science **Canberra, Australia**
Australian National University (ANU) *2019–2024*
Advisor: Prof. Stephen Gould

- Composed image retrieval, vision-and-language tasks.
- Experienced in vision-and-language networks, large language models, diffusion-based image generation and editing.
- Collaborations involve semantic segmentation and weakly-supervised learning.

Bachelor of Engineering Hons (Research & Development) **Canberra, Australia**
Australian National University (ANU) *2015–2018*
First Class Honours

- Major: Electronics and Communication Systems; Minor: Mechatronics Systems.

Previous Experience & Positions

Teaching assistant, Advanced Topics in Machine Learning (Casual position) **Canberra, Australia**
Australian National University *2020–2022*

- Convex analysis, statistical machine learning and deep learning.

Teaching assistant, Digital Systems and Microprocessors (Casual position) **Canberra, Australia**
Australian National University *2018*

- FPGA and ARM architecture.

Research internship **Sydney, Australia**
Commonwealth Scientific and Industrial Research Organisation (CSIRO)'s Data61 *2017–2018*

- Traffic incident analysis and multilevel traffic scenario simulation.
- Follow-up project on XgBoost incident duration prediction for publication.

Academic Services

Reviewer for
CVPR, ECCV, ICCV — *multiple years*;
ACM Multimedia (ACM-MM) 2024;
Transactions on Machine Learning Research (TMLR) — *regularly*;
IEEE Transactions on Multimedia (TMM).

Chair for
DICTA 2025.

Selected Research Projects

See complete list at my homepage.
First-author:

Frame-wise Conditioning Adaptation for Fine-Tuning Diffusion Models in Text-to-Video Prediction.
Under review 2025

- **Z Liu**, J Wang, Z Duan, C Rodriguez-Opazo, A Hengel.
- Video generation via fine-tuning; adapter architectural design; text-video prediction.

Candidate set re-ranking for composed image retrieval with dual multi-modal encoder.
Transactions on Machine Learning Research (*TMLR*) 2024

- **Z Liu**, W Sun, D Teney, S Gould.
- Vision-language reasoning; cross-attention module design; composed image retrieval.

Bi-directional training for composed image retrieval via text prompt learning.
IEEE Winter Conference on Applications of Computer Vision (*WACV*) 2024

- **Z Liu**, W Sun, Y Hong, D Teney, S Gould.
- Vision-language reasoning; task-specific training strategy; composed image retrieval.

Image retrieval on real life images with pre-trained vision-and-language models.
IEEE International Conference on Computer Vision (*ICCV*) 2021

- **Z Liu**, C Rodriguez-Opazo, D Teney, S Gould.
- Vision-language reasoning; task-specific transformer adaption; dataset collection and task-specific metric; composed image retrieval.

Collaborations:

OpenKD: opening prompt diversity for zero- and few-shot keypoint detection.
European Conference on Computer Vision (*ECCV*) 2024

- C Lu, **Z Liu**, et al.
- Leveraging LLM for supporting diverse prompts; few and zero-shot keypoint detection.

Learning audio-visual source localization via false negative aware contrastive learning.
IEEE Computer Vision and Pattern Recognition (*CVPR*) 2023

- W Sun, J Zhang, J Wang, **Z Liu**, et al.
- Multi-modal learning; task-specific contrastive learning; audio-visual source localization.

All-pairs consistency learning for weakly supervised semantic segmentation.
IEEE International Conference on Computer Vision (*ICCV*), *Workshop on New Ideas in Vision Transformers* 2023

- W Sun, Y Zhang, Z Qin, **Z Liu**, et al.
- Exploiting relationships of attention weights; weakly supervised semantic segmentation.

Technical Skills

Experienced in

- **Deep learning programming** Python.
- **Deep learning frameworks and related tools** PyTorch, and Caffe; Docker, Kubernetes, and Slurm.
- **Machine learning libraries** Scikit-learn, XgBoost.
- **Data collection** through Amazon Mechanical Turk.

Other skills

- **Other programming languages** Matlab, Verilog and LaTeX.
- **Web development frameworks** Bootstrap, Astro, Django. Actively maintaining a benchmark server.