Zheyuan (David) Liu

zheyuan.david.liu@outlook.com • zheyuanliu.me

Education

Doctor of Philosophy, Computer Science — **Canberra, Australia**
Australian National University — *Mar 2019–2024 (Thesis submitted)*

- Research surrounds composed image retrieval, broadly in the field of vision-and-language, multi-modal learning.
  Supervised by Prof. Stephen Gould.
- Experienced in vision-and-language pre-trained networks, semantic segmentation and and weakly-supervised learning.
- Experienced in fine-tuning large language models, diffusion-based text-to-image generation, and language-guided image editing.

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

- Majoring in Electronics and Communication Systems, Minoring in Mechatronics Systems.

Selected Research Projects

Click to visit my Google Scholar profile with a comprehensive and up-to-date publication record.

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. Available at arXiv:2305.16304.

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. Available at arXiv:2303.16604.

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. Available at arXiv:2108.04024.

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. Available at arXiv:2303.11302.
- Contribute to the work in ideas and writing.

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. Available at arXiv:2308.04321.
- Contribute to the work in ideas, coding and writing.

Other Academic Activities

Served as reviewers for

- Computer Vision and Pattern Recognition (CVPR)
- European Conference on Computer Vision (ECCV)
- ACM Multimedia (ACM MM)
- IEEE Transactions on Multimedia (TMM)

Work Experience

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

- Graduate-level course offered in the second semesters (in 2020, 2021, and 2022).
- Topics include convex analysis, statistical machine learning and deep learning.
- Course convenor: Prof Stephen Gould.

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

- Undergraduate-level course offered in the first semester (in 2018).
- Topics include FPGA and ARM architecture.
- Course convenor: Dr Jonghyuk Kim.

Research internship (Summer internship program, during the Year 3 & 4 break in undergraduate) — **Sydney, Australia**
Commonwealth Scientific and Industrial Research Organisation (CSIRO)'s Data61 — *Nov 2017–Feb 2018*

- Traffic incident analysis and multilevel traffic scenario simulation with Aimsun.
- Follow-up project on XgBoost incident duration prediction published at the ITS World Congress 2019 here.
- Supervised by Dr Adriana-Simona Mihaita.

Skills

Experienced in

- Python coding.
- Deep learning frameworks and tools (PyTorch and PyTorch-Lightning, Caffe, and Docker environment).
- Machine learning libraries and tools (scikit-learn, XgBoost).
- Deep learning dataset collection through Amazon Mechanical Turk.

Other skills

- **Programming Languages** Python, Matlab, Verilog and LaTeX.
- **Web development** Bootstrap, Django. Actively maintaining a dataset benchmark server.
- Can work alone or in a team. Excellent communication skills.

Languages

- **Mandarin Chinese** native.
- **English** Fluent.