

# Zheyuan (David) Liu

✉ zheyuan.liu@anu.edu.au • 🌐 zheyuanliu.me

## Education

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### Doctor of Philosophy, Computer Science

Canberra, Australia

Australian National University

Mar 2019–current (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, Minor in Mechatronics Systems.

## Selected Research Projects

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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.

Montreal, Canada

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

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### Served as reviewers for

- Computer Vision and Pattern Recognition (CVPR) 2024
- IEEE Transactions on Multimedia (TMM)

## Work Experience

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### 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

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### 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  $\text{\LaTeX}$ .
- **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.