

# Curriculum Vitae

**Name:** Yichao Cai

**Email:** [yichao.cai@adelaide.edu.au](mailto:yichao.cai@adelaide.edu.au) | **Phone:** +61 478 927 202

**Office:** LG.25.04, AIML Building, Lot Fourteen, Cnr North Tce & Frome Rd, Adelaide

[[Homepage](#)] [[Google Scholar](#)] [[Research Profile](#)] [[GitHub](#)] [[LinkedIn](#)]

## Research Interests

---

- Multimodal representation learning; robustness and generalization
- Identifiable, interpretable representations; latent causal discovery; alignment
- Contrastive learning; generative modeling; language-guided supervision

## Education

---

**Ph.D. in Computer Science**, Adelaide, Australia

*Sep 2023–Present*

School of Computer and Mathematical Sciences, The University of Adelaide

Advisor: Prof. Javen Qinfeng Shi

Research Focus: Robust, interpretable multimodal representation learning integrating vision and language.

**M.Sc. in Instrument Science and Technology**, Wuhan, China

*Sep 2016–Jun 2019*

School of Mechatronics Engineering, Wuhan University of Technology

Advisor: Prof. Xiao Zhou

Thesis: Pedestrian head-pose estimation from traffic video for public-safety analytics.

**B.Eng. in Measurement, Control Technology and Instruments**, Wuhan, China

*Sep 2012–Jun 2016*

School of Mechatronics Engineering, Wuhan University of Technology

Project: Rail-weld inspection system for automated quality and alignment assessment.

## Publications

---

(\* indicates equal contribution)

[1] Liu, Y.; Gong, D.; **Cai, Y.**; Gao, E.; Zhang, Z.; Huang, B.; Gong, M.; van den Hengel, A.; Shi, J. Q. (2025). I Predict Therefore I Am: Is Next Token Prediction Enough to Learn Human-Interpretable Concepts from Data? Preprint. [arxiv:2503.08980](https://arxiv.org/abs/2503.08980)

[2] **Cai, Y.\***; Liu, Y.\*; Gao, E.; Jiang, T.; Zhang, Z.; van den Hengel, A.; Shi, J. Q. (2025). On the Value of Cross-Modal Misalignment in Multimodal Representation Learning. Advances in Neural Information Processing Systems (NeurIPS 2025). [arXiv:2504.10143](https://arxiv.org/abs/2504.10143) (Spotlight, top 3.2%)

[3] **Cai, Y.**; Liu, Y.; Zhang, Z.; Shi, J. Q. (2024). CLAP: Isolating Content from Style Through Contrastive Learning with Augmented Prompts. European Conference on Computer Vision (ECCV 2024), pp. 130–147. [doi:10.1007/978-3-031-72664-4\\_8](https://doi.org/10.1007/978-3-031-72664-4_8)

[4] **Cai, Y.**; Li, D.; Zhou, X.; Mou, X. (2018). Robust Drivable Road Region Detection for Fixed-Route Autonomous Vehicles Using Map-Fusion Images. Sensors 18(12):4158. [doi:10.3390/s18124158](https://doi.org/10.3390/s18124158)

## Professional Experience

---

**Postgraduate Researcher**, Australian Institute for Machine Learning, Adelaide, Australia

*Sep 2023–Present*

- Develop theory and methods for identifiable, robust multimodal (vision–language) representations.
- Lead experiments and maintain open-source codebases; ensure reproducibility and rigorous evaluation.

**Pre-doctoral Research Preparation**, Nanchang, China

*Sep 2022–Sep 2023*

- Conducted self-directed study in probability, optimization, causal inference, and deep learning while awaiting approval of the Australian Subclass 500 visa to commence PhD studies.

**Algorithm Engineer**, Tellhow Software, Nanchang, China

*Jun 2020–Aug 2022*

- Designed and built inspection systems for power-industry equipment; developed automated safety analytics to improve construction workflows.

**Software Engineer**, Huawei Technologies, Dongguan, China

*Jul 2019–Apr 2020*

- Implemented communication service platforms and developed video ringback tone systems.

## Teaching

---

**Head Tutor**, Statistical Machine Learning, The University of Adelaide *Sem. 2 2025*  
Course Coordinator: Dr. Zhen Zhang

- Organized tutor schedules; chaired weekly teaching-team meetings.
- Assessed assignments; provided student support via Q&A.

**Teaching Assistant**, Using Machine Learning Tools, The University of Adelaide *Trim. 2 2025*  
Course Coordinator: Dr. Yiliao Song

- Developed autograding scripts and rubrics; graded assignments; handled student queries.

**Teaching Assistant**, Concepts in AI and ML, The University of Adelaide *Trim. 1 2025*  
Course Coordinator: Dr. Yiliao Song

- Marked assignments and handled student queries.

## Academic Service

---

**Reviewer:** IEEE International Conference on Industrial Informatics (INDIN) 2024

## Honors and Awards

---

Award for Outstanding Graduates, Wuhan University of Technology *Jun 2019*  
Merit Graduate Student Award, Wuhan University of Technology *Nov 2017*

## Technical Skills

---

**ML/AI:** PyTorch; deep learning; statistical machine learning; computer vision  
**Programming/Tools:** Python (NumPy, HuggingFace), C/C++; Git; Linux;  $\text{\LaTeX}$   
**Research:** Experimental design/evaluation; reproducibility; latent-variable modeling

## Scholarly Activities

---

**Poster**, European Conference on Computer Vision (ECCV), Milan, Italy *Sep 29–Oct 4, 2024*  
Presented “CLAP: Isolating Content from Style Through Contrastive Learning with Augmented Prompts.”

**Visiting Student Researcher**, California PATH, UC Berkeley, USA *May 1–Sep 30, 2018*  
Short-term research (non-degree) in computer vision under Prof. Xiao Zhou and Dr. Ching-Yao Chan.

## References

---

Available upon request.