

Ke Xueyi

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Education

Nanyang Technological University

08/2023 - 02/2025

GPA: 4.5/5.0 | M.Sc in Computer Control and Automation

Singapore

- Courses: Machine Vision (A+), Machine Learning (A), Video Signal Processing (A), Robotics & Sensors (A)

Wuhan University

09/2019 - 06/2023

B.Eng in Electrical Engineering and Automation

Wuhan, China

- Courses: Embedded Microprocessor System (A), Electric Circuits (A-), C Programming Language (A)

Publications

- Xueyi Ke**, Satoshi Tsutsui, Yayun Zhang, and Bihan Wen. (2025). [Discovering Hidden Visual Concepts Beyond Linguistic Input in Infant Learning](#). *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*. Accepted.
- Winnie Pang, **Xueyi Ke**, Satoshi Tsutsui, and Bihan Wen. (2024). [Integrating Clinical Knowledge into Concept Bottleneck Models](#). *Medical Image Computing and Computer Assisted Intervention (MICCAI)*. Accepted.

Research Experience

Explainable Computer Vision in Multimodality

10/2023 - Present

Nanyang Technological University

Advisor: Prof. Wen Bihan

- Interpreting CLIP-like multi-modal models by decomposing each neuron's function, explaining neurons using 'dissection' techniques.
- Enhanced model explainability by integrating medical domain knowledge into concept bottleneck models (CBM).
- Achieved a 12%+ improvement in accuracy by applying data augmentation techniques like GANs and rectifying imbalance issues.

Multimodal Perception for Autonomous Driving

05/2023 - 08/2023

Tsinghua University

Advisor: Prof. Wang Li

- Collaborated on the publication 'Object Perception for Autonomous Driving', focusing on single/multi-modal perception.
- Implemented algorithm on a TX2-based mini-unmanned vehicle, achieving over 88% accuracy in campus scene object detection.
- Contributed to constructing the 'Dual Radar' dataset tailored to monitor extreme weather conditions through data analysis techniques.

Industry Experience

Algorithm Research Intern

04/2025 - 06/2025

Alibaba Group, AMAP

Beijing, China

- Led project using multimodal congested chat data for spatio-temporal prediction, achieving 18% gain over SOTA.
- Built attention-based MM-ST fusion framework; applied SFT and LoRA to mine signals from sparse chat using LLMs and MLLMs
- Deployed multimodal features to ETA prediction in real-world setting scenario, achieving a 12.4% reduction performance in MAE.

Data Science Intern

05/2024 - 08/2024

TE Connectivity Ltd. AI Hub

Singapore

- Led the project on AI-driven PCB design, developing a DRL algorithm to optimize component placement under EMI constraints.
- Implemented detection and segmentation algorithm for electric wire images, improving metrics by 20% by addressing class imbalance.
- Designed and implemented a relational database for socket warpage manufacturing process, improving retrieval efficiency by 40%.

Projects

PassGPT - LLM-Powered Tutor for Passing Any Course

03/2024 - 06/2024

- Led pipeline design, defined scope and scenarios for educational QA; applied SFT and RLHF on ~100K domain-specific samples.
- Built an RAG agent with MySQL, AWS S3, and FAISS integration, deployed with Claude, GPT-4, and LLaMA models.
- Collected and structured ~50K educational documents to support accurate and grounded chatbot responses.

Deep Reinforcement Learning Model for Dota Auto Chess

01/2022 - 03/2022

- Implemented a visual detection algorithm for a gaming interface and chessboard, resulting in a 7% improvement over previous SOTA.
- Developed a conservative reward to optimize the model, enabling consistent improvements, and securing a top 4 ranking in gameplay.
- Coordinated with team members to integrate model components and won the top group award for project excellence.

Skills

- Tools & Languages:** Python (PyTorch), C/C++, Bash, Zsh, SQL, Dart (Flutter), Git, Docker
- Languages:** English (Advanced), Chinese (Native)