Junjie Li

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Homepage: https://alex131125.github.io/personal-site-cv/

EDUCATION

Bachelor: Tsinghua University **Beijing, China**
Electronic Information Science and Technology Expected June 2026

Ph.D: Nanyang Technological University **Singapore, Singapore**
Supervised by Prof. Xiaofeng Wang
College of Computing and Data Science Started from Aug. 2026

RESEARCH EXPERIENCE

Large-Scale Audio Processing & FISHER Model. Mar. 2025 – Jun. 2026
Mentor: Prof. Pingyi Fan, Tsinghua University

- Participated in the Anomaly Detection Track of the DCASE 2025 and 2026 challenge. Designed a sound anomaly detection (ASD) system using self-supervised learning (SSL) and generative pre-training techniques.
- Award Outstanding Undergraduate Thesis of Tsinghua University.
- Developed the **FISHER** foundation model to solve signal heterogeneity via an innovative multi-sampling-rate method, achieving SOTA performance with superior parameter efficiency. *(Submitted to IEEE TII; featured by Synced/Jiqizhixin)*

Bulkhead: Automated Detection and Remediation of Container Logic Vulnerability Mar.- Aug 2026
Mentor: Prof. Xiaofeng Wang, Nanyang Technological University

- Developed Bulkhead, a multi-agent framework for detecting and repairing logic vulnerabilities in container ecosystems, focusing on path resolution, symbolic-link handling, TOCTOU, and validation-to-use inconsistencies.
- Integrated LLM-guided patch generation with SPIN/Promela model checking, using counterexample traces to identify invariant violations and iteratively refine candidate patches.
- Evaluated the approach on reproducible real-world vulnerabilities across major container projects, including Docker, runc, containerd, and Podman, covering container escape and path traversal vulnerabilities. Detect and patch 20 vulnerabilities.

PROFESSIONAL EXPERIENCE

Shanghai AI Lab. Jul. – Sep. 2025
Research Intern in AI Security

- Design six types of causal scenarios (e.g. preemption, overdetermination, etc.) based on actual causal relationship theory. Create synthetic video datasets using Blender with variations in object count, entity interactions, and spatial configurations to ensure logical clarity and diversity.
- Develop video QA tasks and construct questions sets. Generate multiple-choice and open-ended questions using large language models (LLMs) combined with manual adjustments. Screen questions to ensure the model derives results through causal reasoning rather than simple keyword matching.
- Contributed to a comprehensive benchmark for human-like causal reasoning, comprising 300 videos and 4,967 questions that cover three causal rungs (discovery, intervention, counterfactual) and eight distinct types, targeting nuanced abilities like causal attribution and responsibility. *(Second author, submitted to CVPR 2026)*

ByteDance Mar. – Aug. 2026
Fronted/ Risk Control Engineering Intern

- Participated in greenfield fronted development and explore full-stack development workflows of risk-control-related business scenarios.
- Contributed to the development of Harness Agent Projects exploring agent-assisted engineering workflows and the integration of AI Agents into practice software development scenarios.
- Received the Best Engineering Practice Award in the ByteDance Internship Challenge, recognizing engineering quality and practical implementation.

SKILLS

- **Skills:** C, C++, Python, proficient in Microsoft Office software (Word/Excel/PowerPoint)
- **Languages:** Mandarin (Native), English (Fluent, GRE 331)
- **Competition:** Top 10 in National Physics Competition Finals, National Training Team member, National Team member, 10th place in Asian Physics Olympiad (APhO).
- **Honors:** Comprehensive Excellence Scholarship, Tsinghua University