Zirui Cheng

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Education

Department of Computer Science and Technology, Tsinghua University — *Beijing, China*
Major in Computer Science and Technology, Minor in Economics and Finance — *Jul 2021 - Current*

- **GPA:** 3.87/4.00
- **Courses:** Software Engineering (A), Artifial Neural Networks (A), Java Programming and Training (A), Introduction to Artificial Intelligence (A-), Introduction to Database Management System (A), Object-Oriented Programming (A), Data Structures, Computer Organizations, Computer Networks.

School of Economics and Management, Tsinghua University — *Beijing, China*
Major in Economics and Finance, Minor in Computer Science and Technology — *Aug 2019 - Jun 2021*

- **Courses:** Econometrics (A), Intermediate Microeconomics (A-), Intermediate Macroeconomics (A-), Principles of Politics (A+), Introductory Psychology (A-), Corporate Finance (A-).

Interests

Human-AI Interaction, Security and Privacy, Social Computing.

Publications

* indicates co-first authorship.

[1] Yuntao Wang*, **Zirui Cheng***, Xin Yi, Yan Kong, Xueyang Wang, Xuhai Xu, Yukang Yan, Chun Yu, Shwetak Patel, Yuanchun Shi. Modeling the Trade-off of Privacy Preservation and Activity Recognition on Low-Resolution Images.
CHI 2023 — *2023 CHI Conference on Human Factors in Computing Systems.*

[2] Mingjie Zhan*, Nan He*, Hanyu Lai*, Chenyang Zhao*, **Zirui Cheng**, Junting Pan, Ruoyu Qin, Ruofan Lu, Rui Lu, Yunchen Zhang, Gangming Zhao, Zhaohui Hou, Han Wu, Zhiyuan Huang, Shaoqing Lu, Ding Liang. TeacherLM: Teaching to Fish Rather Than Giving the Fish, Language Modeling Likewise.
EMNLP 2023 — *The 2023 Conference on Empirical Methods in Natural Language Processing. (In Submission)*

Research Experience

TreeQuestion: Using Multi-layer Multi-choice Questions to Mitigate the Cheating Risks through Generative AI — *La Jolla, California, USA*
Undergraduate Research Assistant, University of California, San Diego, Advisor: Haojian Jin — *Mar 2023 - Current*

- Propose a system AI for university teachers and students to generate multi-layer multi-choice questions based on generative to mitigate the cheating risks of open-ended questions in the face of generative AI.
- Introduce the Ideation-Validation-Generation interaction pattern with generative AI to improve generation quality, which splits education tasks into a series of primitive stages.
- Conduct evaluation studies to investigate the feasibility of generative AI in educational tasks and investigate teachers' time in writing the questions and students' time in answering the questions.

Modeling the Trade-off of Privacy Preservation and Activity Recognition on Low-Resolution Images — *Beijing, China*
Undergraduate Research Assistant, Tsinghua University, Advisor: Yuntao Wang — *Jun 2022 - Feb 2023*

- Propose a framework with ajustable parameters for modeling the trade-off of visual privacy preserving activity recognition under different resolutions using images and videos collected from multimodal applications.
- Investigate the effect of the image resolution on both human and machine's performance on activity recognition task and visual privacy awareness through user studies and computer vision experiments.

TeacherLM: Teaching to Fish Rather Than Giving Fish, Language Modeling Likewise — *Beijing, China*
Research Intern, SenseTime Technology, Advisor: Mingjie Zhan — *Sep 2022 - Dec 2022*

- Propose a large language model — TeacherLM-7.1B with capabilities of explaining the fundamentals, chain of thoughts, and common mistakes for most natural language processing (NLP) samples.
- Validate the data enhancement capability of the prompts generated from TeacherLM-7.1B through instruction finetuning on various dataset.

Course Projects

Web Application: Demand Tracking and Management System *Beijing, China*

Software Engineering, Tsinghua University *Feb 2022 - Jun 2022*

- Develop a demand tracking and management system based on TypeScript and React for software engineers to improve the efficiency of cooperation and refine the goals of development (top 5% of all projects).

Android Application: News Retrieval and Recommendation System *Beijing, China*

Java Programming and Training, Tsinghua University *Jul 2021 - Aug 2021*

- Develop a news retrieval and recommendation system based on Java that integrates multiple sources so that users can browse news in an more personalized and more efficient way (top 5% of all projects).

Honors

2022	**Social Service Excellence Scholarship**, Tsinghua University	*Beijing, China*
2021	**Academic Performance Excellence Scholarship**, Tsinghua University	*Beijing, China*
2021	**First Prize (top 1%)**, Chinese Undergraduate Students' Physics Competition	*Beijing, China*
2020	**Overall Excellence Scholarship (top 10%)**, Tsinghua University	*Beijing, China*
2019	**Freshmen Scholarship**, Tsinghua University	*Beijing, China*

Skills

Programming   Python, C/C++, JavaScript, Java, R, SQL, Matlab.

Frameworks   React, Django, Vue

Languages   Chinese (native proficiency), English (professional proficiency, TOEFL: 102).