Tong Zhang

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Education Background

University of California Irvine (UCI) **Irvine, USA**
MS, Computer Engineering, GPA:3.71/4 *June 2023 - Sep. 2024*

Southern University of Science and Technology (SUSTech) **Shenzhen, China**
Bachelor of Computer Science and Engineering, GPA: 3.65/4 *Sep. 2019 - June 2023*

University of California Irvine (UCI) **Irvine, USA**
Semester Exchange, GPA: 3.62/4 *June 2022 - June 2023*

Research Interest

My research is focused on the development of real-time intelligent systems for multimodal perception and reasoning, which are essential for applications like autonomous driving and healthcare. Key areas of interest include:

- **Multimodal Data Alignment:** Focusing on methods to align and integrate visual, textual, and audio inputs to bridge modality gaps and enhance the quality and scalability of available data sets for advanced AI applications.
- **SVG Generation and Interpretation:** Enhancing the capabilities of AI systems by converting complex visual data into scalable vector graphics (SVGs), making them interpretable by both machines and humans.
- **Efficient Large Language Models:** Developing optimized architectures and training methodologies for LLMs to reduce computational demands and improve energy efficiency, crucial for scalable, real-time applications without compromising performance.

Academic Experience

Human-Readable SVG Generation with Vision Language Models PDF **UIUC**
Assistant Prof. Haohan Wang *Sep. 2023 - May 2024*
PyTorch

- proposed S^2VG^2, the first method combined with a vision language model for SVG generation
- introduced a specialized dataset named SVG-SHAPE, designed for evaluating SVG generation methods and reasoning of LLMs
- demonstrated state-of-the-art performance in SVG reasoning of LLMs and vision metrics

One-shot Controllable Head Avatar with Vertex-feature Transformer PDF **UCI**
Prof. Xiaohui Xie *Apr. 2023 - June 2023*
PyTorch

- proposed CVTHead, a one-shot controllable head avatar framework
- evaluated our method in comparison to other methods for cross-identity reenactment
- demonstrated state-of-the-art performance on VoxCeleb1 and VoxCeleb2

Trajectory Prediction and Driving Video Caption PDF **AIR, Tsinghua University**
Assistant Prof. Hao Zhao *May 2022 - Sep. 2022*
NumPy, PyTorch

- trained a novel end-to-end transformer generating descriptions and explanations of driving videos
- demonstrated state-of-the-art performance in driving video captioning

Professional Experience

Natural Language Processing Engineer PDF — **CUHK-Shenzhen**
Prof. Haizhou Li — *Nov. 2024 - Present*
PyTorch

- conducted a comprehensive analysis of 11 defensive mechanisms applied to 6 LLMs, evaluating their impact on model performance, over-refusal, and token overhead.
- proposed the 9 **meta-defenders** to systematically analyze the side effects of defense mechanisms, providing insight into the trade-offs between model safety and performance.
- implemented and evaluated token compression on audio language models

Teaching Assistant for Introduction to Java Programming — **SUSTech**
Associate Prof. Yu Zhang — *Mar. 2023 - June 2023*
English, Java

- designed and graded a significant portion of the coursework, including assignments and projects.
- developed and managed an online judging platform for evaluating student code submissions

Lightweight OCR Models Support for OpenCV Report — **Google Summer of Code 2022**
OpenCV — *May 2022 - Sep. 2022*
PyTorch, ONNX, C++

- implemented the detection part of PP-OCRv2 model in OpenCV Zoo by ONNX
- implemented high level C++ API of PP-OCRv2 model in OpenCV
- implemented evaluation metrics of text detection (AP, Recall, Precision, Hmean) in OpenCV Zoo

Publications

Tong Zhang, Yiming Chen, Simin Chen, Zexin Li, Xianghu Yue, Cong Liu, Chenyu You, and Haizhou Li, "Unintended Side Effects of Defense Mechanisms in Large Language Models: A Comprehensive Study", ***Under Review*** , 2025

Tong Zhang , Haoyang Liu , Peiyan Zhang , Yuxuan Cheng and Haohan Wang, "Beyond Pixels: Exploring Human-Readable SVG Generation for Simple Images with Vision Language Models", ***Preprint***, 2024

Haoyu Ma, **Tong Zhang**, Shanlin Sun, Xiangyi Yan, Kun Han and Xiaohui Xie, "CVTHead: One-shot Controllable Head Avatar with Vertex-feature Transformer", *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, 2024

Bu Jin, Xinyu Liu, Yupeng Zheng, Pengfei Li, Hao Zhao,**Tong Zhang**, Yuhang Zheng, Guyue Zhou and Jingjing Liu, "ADAPT: Action-aware Driving Caption Transformer", *IEEE International Conference on Robotics and Automation (ICRA)*, 2023

Awards

- 2nd place of 2022 APAC HPC-AI Competition — *Nov. 2022*
- Outstanding Anti-COVID19 Volunteer (SUSTech) — *Apr. 2020*

Expert Skills

- Programming Languages: C++, Python, Java
- Libraries/Software: PyTorch, NumPy, Latex