

ZHIZHOU SHA

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Education

Department of Computer Science and Technology, Tsinghua University

2020.9 - present

Bachelor's degree in progress

expected to graduate in June 2025

- **Academic performance:** GPA:3.82/4.00
- **Selected Courses of A & A+:**
 - * Research on Trending Topics in Natural Language Processing, Fundamentals of Computer Graphics
 - * Computer Architecture, Cybersecurity Fundamentals, Database Special Topic Training, Principles and Practice of Compiler Construction

Research Experience

mIPC Lab @ UCSD

2023.6 - 2023.12

Advised by Zhuowen Tu

- Incorporate a token-level loss into the fine-tuning objective of Stable Diffusion Models, thereby augmenting the capability for compositional generation of instances across multiple categories.
- Utilize a combination of Mixture of Experts and Textual Inversion to unify the control features within ControlNet.

Publication

TokenCompose: Grounding Diffusion with Token-level Supervision

CVPR 2024

Zirui Wang, Zhizhou Sha, Zheng Ding, Yilin Wang, Zhuowen Tu

- Introduce token-wise consistency terms between the image content and object segmentation maps in training text-to-image models for enhanced multi-category instance composition.
- [TokenCompose Project page](#)

OmniControlNet: Dual-stage Integration for Conditional Image Generation

Yilin Wang, Haiyang Xu*, Xiang Zhang, Zeyuan Chen, Zhizhou Sha, Zirui Wang, Zhuowen Tu*

- Propose a two-way integration for the widely-adopted ControlNet method by integrating four external condition generation algorithms into a single dense image labeling method, and by integrating its individually trained image generation processes into a single model.

Personal Projects

RL locomotion policy on Unitree H1 Humanoid Robot

Feb 2024

- Training an PBRs(Potential Based Reward Shaping) RL locomotion policy in Isaac gym simulation on the unitree humanoid model H1. The H1 model can walk/jot with arbitrary velocity commands that are sampled from the training distribution of commands. Further details can be found on the [project page](#).

Ray Trace image render

May 2023 - June 2023

- Using C++, implemented an image render system based on sppm algorithm, supporting basic optical phenomena such as reflection, refraction, diffuse reflection, also includes advanced features like depth of field, chromatic aberration and ray tracing acceleration.

dbtrain database

Feb 2023 - June 2023

- Using C++, implemented a database system that supports basic operations such as creating, deleting, updating, and retrieving data, also includes advanced features like transaction management, backup and recovery mechanisms and concurrency control.

Mini C++ Compiler

Sep 2022 - Dec 2022

- Using Python, implemented mini C++ compiler, which includes three main parts, syntactic and semantic parsing, control flow analysis and Risc-V code generation.

Mini Risc-V Processor

Sep 2022 - Dec 2022

- Using Verilog, implemented a mini CPU which supports fundamental instruction set of Risc-V, also includes advanced features like VGA, interrupt and exception for operating system.

Technical Skills

Programming: C++, Python (PyTorch), LaTeX, Linux, JavaScript