JUNYI ZHANG

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RESEARCH INTERESTS

My research interests mainly lie in **computer vision**, **deep generative models**, and **representation learning**. I am now focusing on the **application of diffusion models**, exploring its potential for **both generation and perception scenarios**. I also have a background in action recognition, self-supervised learning, and modalities such as video, 3D, human motion, and language.

EDUCATION

Shanghai Jiao Tong University — Shanghai, China
Major in Computer Science and Technology; GPA: 3.92 — Sept. 2020 - Present

Zhiyuan College, Shanghai Jiao Tong University — Shanghai, China
Major in Zhiyuan Honors Program of Engineering (Top 5%) — Sept. 2020 - Present

SELECTED AWARDS

Microsoft Research "Stars of Tomorrow" Certificate (Top 10% interns) 2022
Huawei Fellowship (Top 1% in honors program) 2022
National Scholarship (Top 0.2% nationwide, highest honor in China) 2021
Undergraduate Merit Scholarship, A Level, SJTU (Top 1%) 2021

PUBLICATIONS

A Tale of Two Features: Stable Diffusion Complements DINO for Zero-Shot Semantic Correspondence.
Junyi Zhang, Charles Herrmann, Junhwa Hur, Luisa F. Polanía, Varun Jampani, Deqing Sun, Ming-Hsuan Yang. *In submission to NeurIPS*, 2023.

LayoutDiffusion: Improving Graphic Layout Generation by Discrete Diffusion Probabilistic Models.
Junyi Zhang, Jiaqi Guo, Shizhao Sun, Jian-Guang Lou, Dongmei Zhang. *In ICCV*, 2023.

Bridging The Isolated Islands in Human Action Understanding.
Yong-Lu Li*, Xiaoqian Wu*, Xinpeng Liu, Yiming Dou, Yikun Ji, **Junyi Zhang**, Yixing Li, Xudong Lu, Jingru Tan, Cewu Lu. *Under review*, 2023.

Mining Cross-Person Cues for Body-Part Interactiveness Learning in HOI Detection.
Xiaoqian Wu*, Yong-Lu Li*, Xinpeng Liu, **Junyi Zhang**, Yuzhe Wu, Cewu Lu. *In ECCV*, 2022.

EXPERIENCE

University of California, Merced - Vision Learning Lab — *Merced, California*
Visiting Student – Supervisor: *Prof.* Ming-Hsuan Yang — June. 2023 - Present

- **Diffusion Models for Semantic Correspondence**
  - Explore the internal representations of text-to-image diffusion models for semantic correspondence.
  - Discover the complementary of Stable Diffusion features and DINOv2 features, based on which achieve state-of-the-art performance under zero-shot setting on a variety of semantic correspondence benchmarks.
  - Paper submitted as first author to **NeurIPS'23**. More details at project page.

Microsoft Research Asia - Data, Knowledge and Intelligence Group — *Beijing, China*
Research Intern – Mentor: *Dr.* Shizhao Sun and *Dr.* Jian-Guang Lou — July 2022 - Dec. 2022

- **Diffusion Models for Layout Generation, AI for Design Project**
  - Study the application of diffusion models in graphic design, especially the graphic layout generation.
  - Develop discrete diffusion models specific to layout data, achieve state-of-the-art performance in unconditional and conditional generation tasks for several public layout datasets.
  - Paper accepted as first author to **ICCV'23**, with potential for product implementation.

Shanghai Jiao Tong University - Machine Vision and Intelligence Group *Shanghai, China*
Undergraduate Research Intern – Supervisor: *Prof.* Yong-Lu Li Oct. 2021 - Present

- **Unified Human Action Understanding Project**
  - Research on unifying multi-modal physical action spaces (2D, 3D, image, video, etc.) to a unified semantic space through the introduction of linguistic structure knowledge.
  - Design and conduct experiments to extend our method on video datasets and verify the performance.
- **Human Action Knowledge Engine Project**
  - Study on improving Human-Object Interaction (HOI) detection by incorporating human action knowledge.
  - Conduct experiments to examine the effect of image depth and multi-person interactions on HOI detection.
  - Research results were submitted as co-author in two papers, one of which was accepted by **ECCV'22**.

SKILLS

- **Skills:** Python (Pytorch), C/C++, html, css, Linux, LaTeX, Assembly language
- **Languages:** English (TOEFL 105/120), Chinese (Native)