ZHI TU

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EDUCATION BACKGROUND

Purdue University *Aug.2022-Now*
Ph.D. Student in Computer Science *West Lafayette, U.S.*
Ross Fellowship | Cumulative GPA: **4.0/4.0**

University of Southern California *Aug.2020-Aug.2022*
Master of Science in Computer Science *Los Angeles, U.S.*
Cumulative GPA: **3.95/4.0** | USC Honors Program

ShanghaiTech University *Sep.2016-Jun.2020*
Bachelor of Engineering in Computer Science *Shanghai, China*
Cumulative GPA: **3.66/4.0** | Ranking: **10/116**

University of California, Berkeley *Jul. 2017*
Summer Session | GPA: **4.0/4.0** *Berkeley, U.S.*

SELECTED PUBLICATIONS

[1] Lu Ling, Yichen Sheng, ***Zhi Tu***, Wentian Zhao, Cheng Xin, Kun Wan, Lantao Yu, Qianyu Guo, Zixun Yu, Yawen Lu, Xuanmao Li, Xingpeng Sun, Rohan Ashok, Aniruddha Mukherjee, Hao Kang, Xiangrui Kong, Gang Hua, Tianti Zhang, Bedrich Benes, Aniket Bera, **"DL3DV-10K: A Large-Scale Scene Dataset for Deep Learning-based 3D Vision"**. *2024 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024
Paper Code

[2] Yao Deng, Jiaohong Yao, ***Zhi Tu***, Xi Zheng, Mengshi Zhang, Tianyi Zhang, **"TARGET: Traffic Rule-based Test Generation for Autonomous Driving Systems."** *CoRR*, 2023
Paper

[3] Yifeng Wang*, ***Zhi Tu****, Yiwen Xiang, Shiyuan Zhou, Xiyuan Chen, Bingxuan Li and Tianyi Zhang, **"Neuro-Symbolic Learning for Rapid Image Labeling"**, in *Proceedings of the 29th ACM SIGKDD Conference on Knowledge Discovery and Data Mining, KDD 2023, Long Beach, CA, USA, August 6-10*, 2023
*Equal contribution.
Paper Code

[4] Shenhan Qian*, ***Zhi Tu****, Yihao Zhi*, Wen Liu and Shenghua Gao, **"Speech Drives Templates: Co-Speech Gesture Synthesis With Learned Templates"**, in *2021 IEEE/CVF International Conference on Computer Vision, ICCV 2021, Montreal, QC, Canada, October 10-17*, 2021
*Equal contribution.
Paper Code

[5] Wen Liu, Zhixin Piao, ***Zhi Tu***, Wenhan Luo, Lin Ma, and Shenghua Gao, **"Liquid Warping GAN with Attention: A Unified Framework for Human Image Synthesis"**, in *Pattern Analysis and Machine Intelligence (PAMI)*, 2021
Paper Code

[6] ***Zhi Tu***, Shenghua Gao and Kang Zhou et al., **"SUNet: A Lesion Regularized Model for Simultaneous Diabetic Retinopathy and Diabetic Macular Edema Grading"**, in *2020 IEEE 17th International Symposium on Biomedical Imaging (ISBI)*, 2020.
Paper

TEACHING EXPERIENCE

Teaching Assistant, CS37300, Data Mining and Machine Learning *Spring Sem.2024*
Purdue University

Teaching Assistant, CS37300, Data Mining and Machine Learning *Fall Sem.2023*
Purdue University

Teaching Assistant, CSCI 570, Analysis of Algorithms *Spring Sem.2022*
University of Southern California

Teaching Assistant, CSCI 570, Analysis of Algorithms *Fall Sem.2021*
University of Southern California

Teaching Assistant, CS 172, Computer Vision *Fall Sem.2019*
ShanghaiTech University

RESEARCH EXPERIENCE

Pretty and Shiny! Visual Saliency-guided Curiosity for Self-Supervised RL.
iLab | Supervisor: Laurent Itti *May 2021-May 2022*
Objective: To propose a deep reinforcement learning algorithm using saliency curiosity mechanism to improve the performance in exploring the environment.
Core contents:

- To propose a novel reward with saliency curiosity.
- To train the agent explore the environment mimicking the performance of human.
- To navigate the agent with the information retrieved by the exploration phase.

Speech Drives Templates: Co-Speech Gesture Synthesis With Learned Templates.
Accepted by ICCV 2021 | *SVIP Lab* | *Supervisor: Shenghua Gao* *Sep.2020-Aug.2021*
Objective: To propose a unified model to generate gesture of a talking person given the audio of the speech.
Core contents:

- To generate speech audio aligned talking gesture.
- To guarantee the generated gesture to be smooth with variety.
- To propose a valid metric to assess the quality of generated gesture.

Liquid Warping GAN with Attention: A Unified Framework for Human Image Synthesis
Accepted by IEEE TPAMI | *SVIP Lab* | *Supervisor: Shenghua Gao* *Sep.-Dec.2019*
Objective: This project is to improve the performance of the result of human image synthesis, in terms of higher resolution, more stable and smoother synthesized image. Based on the ICCV paper "Liquid Warping GAN: A Unified Framework for Human Motion Imitation, Appearance Transfer and Novel View Synthesis", we propose a more advanced network architecture to achieve these.
Core contents:

- We propose an Attentional Liquid Warping Block (AttLWB) to pursue more stable and smoother results.
- We apply one/few shot learning to improve the generalization of our proposed model.
- Our model can achieve higher resolution results (512 x 512) and the previous ICCV paper can only handle 256 x 256 resolution.

SUNet: A Lesion Regularized Model for Simultaneous Diabetic Retinopathy and Diabetic Macular Edema Grading
Accepted(oral) by IEEE ISBI 2020 | *SVIP Lab* | *Supervisor: Shenghua Gao* *Jan.-Jun.2019*
Objective: The approach is to propose a multi-task CNN to improve the performance of diabetic retinopathy and diabetic macular edema grading at the same time.
Core contents:

- Proposed a multi-disease network (SUNet) for simultaneous grading DR and its complication DME. As far as we know, this is the first work for simultaneous DR and DME grading;
- Introduced a lesion regularizer module into the disease detection network which enforces network concentrates on those lesions, meanwhile segmentation also provides a cue for a doctor to better understand the prediction results;

- Designed a SUNet to interleave feature maps for the multi-disease diagnosis and lesion regularization, and it is a novel multi-task learning framework, which can be readily applied to other multi-task learning scenarios.

PROFESSIONAL SKILLS

Programming Languages: Python, MATLAB, C/C++, Rust, MIPS
SDKs & Tools: pyTorch, Git, Linux Shell, OpenGL, MULTISIM, LaTeX

CONFERENCE EXPERIENCE

KDD 2023 | Location: Long Beach, U.S. *Aug.2023*
ICCV 2021 | Online *Oct.2021*
IEEE ISBI 2020 | Online, Oral Presentation *Apr.2020*
MICCAI 2019 | Location: Shenzhen, China *Oct.2019*
— *Undergraduate Student Travel Award*
ASSIST 2019 | Location: Shanghai, China *Aug.2019*
IEEE EMBC 2018 | Location: Hawaii, U.S. *Jul.2018*

WORK EXPERIENCE

Research Assistant at SVIP Lab of ShanghaiTech University *Sep.2020-Jun.2021*