Linjie Tong

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Education

Master of Science in Electrical and Computer Engineering, Advised by Prof. Minh Do,
University of Illinois at Urbana-Champaign with GPA 4.00 Aug. 2023—May 2025
Bachelor of Science in Electrical Engineering with Minor in Computer Science, graduated with Highest Honors,
University of Illinois at Urbana-Champaign with GPA 3.90 Sept. 2019—June 2023
Bachelor of Engineering in Electrical Engineering, Advised by Prof. Zuozhu Liu,
Zhejiang University with GPA 3.99 Sept. 2019—June 2023

Research Experience

Multi-Modal Ear Optical Coherence Tomography(OCT) Image Recognition **Feb. 2024 —Present**
University of Illinois at Urbana-Champaign, Supervisor: Prof. Minh Do *Champaign, IL.*

- Developed an algorithm to effectively remove noise and artifacts from original images.
- Employed Multi-task Learning, Contrastive Learning and Transfer Learning techniques to accurately extract features from multi-modality Optical Coherence Tomography (OCT) images.
- Engineered a generative algorithm to address and mitigate data imbalance issues.
- Prepare a research paper for submission to npj Digital Medicine.

Zero-Shot Medical and Emotion Image Recognition **May 2023 —July 2023**
Zhejiang University, Supervisor: Prof. Zuozhu Liu *Haining, Zhejiang*

- Proposed a novel CLIP-based framework with a large language model for explainable healthcare image recognition.
- Designed specific prompts to enhance the quality of generated texts by a large language model.
- Conducted experiments to demonstrate effectiveness and explainability of our zero-shot healthcare image recognition pipeline.
- Output paper "An Explainable Framework Exploiting Large Language Models for Zero-Shot Medical Image Recognition" which is under review by IEEE Transactions on Emerging Topics in Computational Intelligence (TETCI).

Segmentation of Dental CBCT Images **June 2022 —May 2023**
Zhejiang University, Supervisor: Prof. Zuozhu Liu *Haining, Zhejiang*

- Explored innovative approaches to improve the accuracy of segmentation of dental images.
- Proposed a pipeline with novel data augmentation method and loss function based on the prior information of dental images.
- Output conference paper "TSNet: Integrating Dental Position Prior and Symptoms for Tooth Segmentation from CBCT Images" which is admitted by The International Conference on Medical Imaging with Deep Learning (MIDL) 2023 short paper track.

Medical Image Translation Using Generative Adversarial Networks **May. 2022 — July. 2022**
University of Illinois at Urbana-Champaign, Supervisor: Prof. Zhi-pei Liang *Champaign, IL.*

- Nvestigated the effects of variations in loss functions on the outcome of the medical image translation.
- Searched for the optimal loss functions for specific use cases and/or types of patients.
- Formulated and programmed several loss functions based on Mutual information.

Investigation of Reflection in Genetic Algorithms **Feb. 2021 — May 2022**
Zhejiang University, Supervisor: Prof. Schewe, Klaus-Dieter *Haining, Zhejiang*

- Led the project team to investigate the relationship between reflective and genetic algorithms.
- Aimed to prove that every genetic algorithm can be represented by reflective Abstract State Machine
- Conducted a case study on Parallel recombinative simulated annealing, a specification of genetic algorithms, using reflective Abstract State Machine.
- Output conference paper "Exploration of Reflective ASMs for Genetic Algorithms and Security" which is admitted by 8th International Conference on Rigorous State-based Methods (ABZ 2023).

Skills

Tools and Languages	Python, LaTeX, Cuda C, System Verilog, C, C++, , Ansys, Matlab
Main Courses have learnt	Random Process, Vector Space Signal Processing, Computer Vision, Pattern recognition, Numerical Method, Applied Parallel Programming, Control System, Artificial Intelligence, Data Mining, Computer Systems & Programming, Data Structure.

Publications

Tong, Linjie, Jiaxiang Liu, et al. (2023). "TSNet: Integrating Dental Position Prior and Symptoms for Tooth Segmentation from CBCT Images". In: *Medical Imaging with Deep Learning, short paper track*. URL: https://openreview.net/forum?id=FCYGwhzF7E.

Tong, Linjie, Ke Xu, et al. (2023). "Exploration of Reflective ASMs for Security". In: *Rigorous State-Based Methods*. Ed. by Uwe Glässer et al. Cham: Springer Nature Switzerland, pp. 185–192. ISBN: 978-3-031-33163-3.