Tang, Zijia (Thomas)

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Interest area: Artificial Intelligence, Large Language Model, Bioinformatics

EDUCATION

Duke University — Aug. 2024 – On going
Computer Science Major — GPA: 4.0 / 4.0

PUBLICATION

scPerb: Single-cell Perturbation via Style Transfer-based Variational Autoencoder | First Author | Published in Journal of Advanced Research (**Impact Factor: 11.79**)

- Designed and developed **scPerb**, a novel deep learning framework that accurately predicts single-cell transcriptional responses to gene or drug perturbations by leveraging a hybrid of **style transfer** and **variational autoencoder (VAE)** architectures. Reduced the need for expensive and labor-intensive wet-lab experiments.
- Demonstrated that scPerb achieves **state-of-the-art accuracy (99.5%)**, significantly outperforming existing models.
- Presented both a **5-minute oral talk** and a **poster presentation** at the **MCBIOS 2025 Conference**, receiving positive feedback from domain experts for its innovation.
- Published in the high-impact, peer-reviewed *Journal of Advanced Research* (DOI: 10.1016/j.jare.2024.10.035).

PINet: Privileged Information Improves the Interpretability and Generalization of Structural MRI in Alzheimer's Disease | Independent Researcher | First Author | Presented at ACM-BCB 2024

- Proposed PINet, a novel hybrid deep learning architecture integrating Convolutional Neural Networks (CNNs) and Transformers, augmented with privileged information during training to enhance interpretability and generalizability in structural MRI analysis.
- Achieved **nearly 96% classification accuracy** in **early** Alzheimer's Disease detection, outperforming traditional deep learning baselines on benchmark datasets.
- Accepted as a rapid-fire paper by the ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM-BCB), awarded to the **top 25%** of submissions.
- DOI: 10.1145/3584371.3613000

Interpretation of interstitial lung diseases from magnetic resonance image using deep learning | **Independent researcher | First Author |** Published in AEIS 2022 Conference

- Developed **ConvT**, an end-to-end deep learning pipeline for differentiating **Nonspecific Interstitial Pneumonia (NSIP)** and **Usual Interstitial Pneumonia (UIP)** using non-invasive **MRI** scans, addressing diagnostic ambiguity in clinical radiology.
- Published at the **2022 International Conference on Advanced Engineering and Intelligent Systems (AEIS),** DOI: 10.1109/AEIS59450.2022.00027.

PROJECTS

Desktop Video for mac **| Language:** ***Swift, SwiftUI, AVFoundation***

- Engineered a lightweight macOS application enabling users to set videos and images as dynamic desktop wallpapers across multiple monitors.
- Implemented support and features like HDR playback, real-time volume control, stretch-to-fit rendering, and seamless multi-screen synchronization, status persistence, and bookmark access to support sandboxed macOS environments.

SSAPAutoCalendar **| Language:** ***Python, HTML***

- Designed a backend utility to automatically retrieve, parse, and update academic calendar data from dynamic HTML pages hosted on university and high school servers.
- Implemented robust HTML parsing and scheduling logic to transform unstructured web content into structured, machine-readable formats.

WORK AND RESEARCH EXPERIENCE

High school & Undergraduate Intern at Song Lab (Department of Health Outcomes & Biomedical Informatics at the University of Florida) — May 2023 – Present

Undergraduate Intern at Yi Zhang's Lab (Department of Neurosurgery and Department of Biostatistics and Bioinformatics at Duke University) — Aug 2024 – Present