Yutong Wang

+86 18912988997 | anthonywang0705@gmail.com | Guangzhou, Guangdong Province, China

EDUCATION

South China University of Technology
B.Eng. Biomedical Engineering — June 2026 (expected)

RESEARCH EXPERIENCE

Neural Field-Based Registration on Histopathology Images — July 2025 - Present
Xie Lab (University of California, Irvine)
Research Intern (Supervisor: Prof. Xiaohui Xie)

- We proposed a neural field-based registration pipeline for histopathological images, enabling spatial alignment across different modalities of DAPI-stained tissues.
- Following a coarse-to-fine strategy, we first derive outline-based and patch-based affine transform matrix, and finally carry out a strongly supervised fusion step with the aid of Neural Field.
- We incorporated pretrained Cellpose-SAM into the pipeline. By jointly optimizing the registration loss and segmentation loss, the method improves registration speed while maintaining alignment accuracy.

An Electron-Density Point-Cloud Framework for DPI Prediction — Oct. 2024 - June 2025
Under Review: *Nature Communications*
Xu Lab (SCUT)
Core Member (Supervisor: Prof. Shidang Xu)

- Introduced, for the first time, electron cloud structures of molecules computed by quantum chemical computation methods into Drug–Protein Interaction prediction tasks.
- Developed E-CloudBind, a structure-based DPI model that fuses electron-density point clouds with covalent molecular graphs and a heterogeneous GNN to predict protein–ligand affinity.
- Created a density-adaptive interaction definition, yielding robustness to coordinate noise, low-resolution structures, and AlphaFold inputs.
- Achieved state-of-the-art accuracy on PDBbind datasets while maintaining minimal sensitivity to resolution/source; demonstrated superior generalization on out-of-distribution splits.

Minimal High-Resolution Patches Are Sufficient for Whole Slide Image Representation via Cascaded Dual-Scale Reconstruction — June 2025 – Aug. 2025
Xu Lab (SCUT)
Contributing Member (Supervisor: Prof. Shidang Xu)

- We propose a two-stage sampling method based on attention mechanisms and clustering, whose sampling performance surpasses existing purely random sampling and single-stage sampling approaches.
- We design a self-supervised feature extractor for high-resolution images that, while drastically reducing the number of training samples, improves both training speed and model performance.
- On a classification task, the model uses only 4.5% of the data yet improves over state-of-the-art methods by 6.3 percentage points in accuracy and 5.5 points in AUC.

Concentric Dual Fusion Attention-MIL framework for WSI image segmentation — Feb. 2024 - Aug. 2024
Xu Lab (SCUT)
Contributing Member (Supervisor: Prof. Shidang Xu)

- We propose a point-to-area feature enhancement method that leverages a channel-wise point-to-area attention mechanism to assign feature weights to each patch, enhancing representational capacity without requiring self-supervised pretraining.
- A point-to-point spatial fusion strategy is designed, employing a concentric-row attention mechanism to precisely control the influence of distant patches during feature fusion.
- The model demonstrates significantly improved performance over traditional MIL methods in multi-cancer subtype classification tasks, indicating stronger classification capability.

COMPETITIONS

Neurovascular Coupling Mechanism of Adolescent Myopia Based on EEG-fNIRS Fusion May 2024 – Aug. 2024
Medical Information and Neuroimaging Lab (SCUT)
Contributing Member (Supervisor: Prof. Kai Wu)

- We synchronize EEG and brain oxygen signals, collecting neurological and visual function data from adolescents before and after naked-eye 3D training.
- Applied multimodal data analysis methods to investigate the impact of 3D visual training on static and dynamic brain networks and its relationship with binocular accommodation ability.
- Discovered that naked-eye 3D training significantly enhances frontal-occipital functional connectivity, improves brain network efficiency, and shows a strong correlation with adjustment amplitude and speed.
- Provided a scientific basis for neurovascular coupling mechanism in myopia correction, and leveraged a multimodal data analysis system to introduce new methods and insights for myopia prevention, control, and vision health research.
- **First Prize of Guangdong Biomedical Engineering Innovation Design Competition** June 2024
- **Third Prize of National Biomedical Engineering Innovation Design Competition** July 2024

SKILLS AND INTERESTS

Languages: Mandarin-Native, English-Proficient
Programming: Python
Interests: Movie, Weight Training, Table Tennis