

# Yutong Wang

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## EDUCATION

**South China University of Technology (SCUT)**

**Guangzhou, China**

*B.S. in Biomedical Engineering; GPA: 3.56/4.00*

Expected Jun. 2026

**Coursework:** Calculus, Linear Algebra and Analytic Geometry, Probability Theory and Mathematical Statistics, College Physics, Inorganic Analytical Chemistry, Organic Chemistry, Circuits and Electronics, Cell Biology, Physical Chemistry, Signals and Systems, Fundamentals of Biomaterials Science, Digital Signal Processing, Biochemistry

**Awards:** First Prize of National Biomedical Engineering Innovation Design Competition, Jul. 2024; First Prize of Guangdong Biomedical Engineering Innovation Design Competition, Jun. 2024; Outstanding Communist Youth League Member, May 2024 & May 2023

## RESEARCH EXPERIENCE

### Conditional Generative Modeling Based on Fuzzy Structure and Multiple Bonding Force Properties

*Research Assistant, Supervised by Prof. Shidang Xu, SCUT*

May 2024-Jan. 2025

- Developed an a priori model for property prediction based on electron cloud density (including non-covalent bonding information) and 3D structure (including covalent forces), providing constraints on molecule-protein binding tightness, and quantifying molecule-protein binding tightness through potential variables of regression tasks to realize explicit control of the generation process.
- Created a conditional generation model utilizing coarse-grained/fuzzy structural and multi-bonding force properties, with electron cloud density and van der Waals volume fuzzy 3D protein structures as inputs; guided molecule generation for specific targets through quantitative structure-property relationship (QSPR) models that incorporate covalent and non-covalent bonding information (multiple force fields).
- Enhanced molecular precision with conditional generation models to optimize binding affinity and achieve specific molecular targeting properties, providing model support and generation potential for drug development.

### Concentric Dual Fusion Attention-MIL framework for WSI image segmentation

*Research Assistant, Supervised by Prof. Shidang Xu, SCUT*

Feb.- Aug. 2024

- Point-to-Area Feature Enhancement Method: This method utilizes a point-to-area feature-column attention mechanism of channel correlation modeling to assign weights for each patch's feature, enhancing the feature representation ability without the need for self-supervised pretext task training.
- Point-to-Point Precise Spatial Fusion Strategy: CDFA-MIL employs a point-to-point concentric-row attention mechanism, efficiently managing the influence of distant patches in fusion.
- Enhanced Performance in Cancer Subtype Classification: Applied to multi-cancer subtype classification, CDFA-MIL demonstrates superior performance over traditional MIL methods.

### Classification and Optimization of Type I and II Photosensitizers for Drug Discovery

*Student Research Training Program Leader, Supervised by Prof. Shidang Xu, SCUT*

Mar. 2024

- Conducted a literature review on type I and type II photosensitizers using Google Scholar, gathering background information, preparation methods, and molecular structures; created a complete dataset by drawing molecular structures in ChemDraw and exporting them to SMILES format.
- Developed Python programs to train the dataset using classification models, including gradient boosting (GB), K nearest neighbor (KNN), random forest (RF) and support vector machine (SVM), and compared model performance.
- Applied the SMOTEENN method to balance type I and type II photosensitizers sample size, enhancing the prediction performance of classification models on the imbalanced dataset.
- Analyzed training results to summarize classification effectiveness, supporting improved efficiency in kinetic therapeutics development and potential drug screening.

## SKILLS

**Technical:** Python, MATLAB, ChemDraw, MS Office

**Languages:** Mandarin Chinese(native); English (proficient)