Yi Zhou

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Education

2021 – 2024 **Sichuan University**, M.S. in Computer Science and Technology, *GPA: 3.76/4*.
Advisor: Prof. Min Zhu, Lab: Vision Computing Lab

2017 – 2021 **Sichuan University**, B.E. in Computer Science and Technology, *GPA: 3.77/4*.
Under the Wu Yuzhang Honors program

Research Interests

My current background is in bioinformatics and data visualization, and I am interested in **Graph Machine Learning & Data Mining**. Taking "knowledge understanding" as the core, there are many interesting intersections, language models + graph neural networks learn from the data, and AI4Science + explainable AI + human-computer interaction benefit humans.

Publications and Preprints

BIB'22 **Yi Zhou**, Xinyi Wang, Lin Yao, Min Zhu. "LDAformer: Predicting LncRNA-Disease Associations based on Topological Feature Extraction and Transformer Encoder". *Briefings in Bioinformatics*. (JCR-Q1, IF: 9.5)

ChinaVis'23 Wenwen Gao, Shangsong Liu, **Yi Zhou**, Fengjie Wang, Feng Zhou, Min Zhu. "GBDT4CTRVis: Visual Analytics of Gradient Boosting Decision Tree for Advertisement Click-Through Rate Prediction". *The 10th China Visualization and Visual Analytics Conference*.

Under Review **Yi Zhou**, Meixuan Wu, Chengzhou Ouyang, Xinyi Wang, Min Zhu. "Generalizable Prediction of Potential MiRNA-Disease Association based on Heterogeneous Graph Learning".

Under Review Jiamin Zhu, Meixuan Wu, **Yi Zhou**, Min Zhu. "Dowsing: A Task-Driven Approach for Multiple-View Visualizations Dynamic Recommendation".

Research Experience

Jan 2021 – Present **Research in Link Prediction on Biomedical Interaction Graph**, *Project "Visual Analysis of Heterogeneous Graph for Disease-Regulatory Factor", supported by NSFC*.

- Wrote the research content in the project declaration.
- Proposed **a Link Prediction method for lncRNA-disease** that outperformes sota baseline methods. It is composed of a process to extract multi-hop pathways between node pairs from similarity and association information and a Transformer encoder to learn the interdependencies between pathways. Published one paper in *Briefings in Bioinformatics*. (BIB'22)
- Developed a visual analytic system for the miRNA-lncRNA-disease graph together with team members, which displays heterogeneous associations based on density contour, explains the heuristic similarities of diseases, and explains the predictions derived by a logistic regression model. (Online Demo)
- Proposed **a Link Prediction method for miRNA-disease** that focuses more on **Generalizability** and **Explainability** in addition to the sota performance of basic metrics. Contributed to the stages of data, model, and result analysis: the problem is described by a miRNA-gene-disease graph constructed by ourselves, and the prediction and analysis are centered on a heterogeneous graph Transformer. Submitted one paper to *Briefings in Bioinformatics*. (Preprint, Github)

Jan 2023 – Apr 2023 **Research in Visualizational Explanation of GBDT**.

- Implemented a demo GBDT model for click-through rate prediction.
- Developed a visual analytic system together with team members, which assists advertising analysts in understanding the working mechanism of GBDT and facilitating the tuning process. (Video)

Jan 2022 – May 2022 **Research in Visualization Recommendation**.
- Implemented an LSTM-based model to perceive users' analytical tasks from historical action sequences.
- Developed a mixed-initiative recommendation system for multiple-view visualizations together with team members, which can utilize and expose the user's potential analysis tasks to recommend visualizations during the explorative building phase. (Webpage, Online Demo)

Patents

2022 Min Zhu, **Yi Zhou**, Xinyi Wang, Lin Yao. Method and System for Long Non-coding RNA-Disease Association Prediction Based on Self-Attention Mechanism. CN115171780A.

2023 Min Zhu, Meixuan Wu, Jiamin Zhu, **Yi Zhou**, Haotian Zhu. An Analytical Task Perception Method that Integrates Deep Learning Models and Rules. CN116303737A.

2023 Min Zhu, Jiamin Zhu, Meixuan Wu, **Yi Zhou**, Haotian Zhu. A Dynamic Visualization Recommendation Method Based on User Tasks. CN116204704A.

2023 Min Zhu, Xiyao Li, Chunlin Long, **Yi Zhou**, Xinyi Wang. Chromatin Topologically Associating Domains Boundary Prediction Method Based on Multimodal Fusion. CN115831217A.

2023 Min Zhu, Fuqiu Chen, Chunlin Long, **Yi Zhou**, Xinyi Wang. A Visualization Method for Chromatin Hierarchy Analysis Based on Genetic Data. CN113946730A.

2022 Min Zhu, Chunlin Long, Mingyang Zhang, Xinyi Wang, **Yi Zhou**. Method and System for Predicting Chromatin Topologically Associating Domains Based on Spectral Clustering. CN114444286A.

Activities

Sep 2022 – Nov 2022 **Sichuan University - Huawei MindSpore Application Case Implementation Project**.
Reproduced Swin Transformer with MindSpore and illustrated a demo of image classification in a Jupyter Notebook file. It is selected as an application case on the official webpage of MindSpore. (Github)

Position of Responsibility

Jul 2022 – Present **Mentor of Bioinformatics Group, Vision Computing Lab**.
Mentoring Meixuan Wu, Chengzhou Ouyang, Wanjing Zhang, Xiyao Li, and Lin Gan.
Ongoing Projects: Prediction of Various Regulatory Factor-Disease Associations, Prediction of Enhancer-Promoter Interactions, Prediction of RNA-Protein Interactions

Sep 2021 – Present **Living Manager, Vision Computing Lab**.
Responsible for all non-academic works in the lab

Honors and Awards

2023 First-class of Excellent Graduate Scholarship by Sichuan University

2023 Tencent Scholarship of Sichuan University

2021, 2022 2 × Second-class of Excellent Graduate Scholarship by Sichuan University

2021 Certificate of Honor from Wu Yuzhang Honors College

Skills

Programming Languages: Python, PyTorch, PyG, Pandas, JavaScript, HTML/CSS, SQL, Linux command, Git

Languages: Chinese, English, Fuzhou dialect