Jiacong Mi

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Education

Southeast University **2021.9 – 2024.6**

Master of Artificial Intelligence *Nanjing, China*

- WAM: 83.33/100, Second Class Academic Scholarship for two times (top25%)
- Relevant Courses: Pattern Recignition, Database Management Systems, Algorithm Design and Analysis

Monash University **2021.9 – 2024.6**

Master of Information Technology Systems *Suzhou, China*

- Relevant Courses: Machine Learning, Deep Learning, Natural Language Processing

Shandong Normal University **2017.9 – 2021.6**

Bachelor of Computer Science and Technology *Jinan, China*

- WAM: 77.5/100
- Relevant Courses: Computer Network, Computer Composition Principle, Operating System

Publication

- **Mi, J.**, Zu, Y., Wang, Z., & He, J. (2024). ACDNet: Attention-guided Collaborative Decision Network for effective medication recommendation. Journal of Biomedical Informatics, 149, 104570. (SCI Q2, CCF-C)
- Pu, H., **Mi, J.**, Lu, S., & He, J. (2023). RoKEPG: RoBERTa and Knowledge Enhancement for Prescription Generation of Traditional Chinese Medicine. In 2023 IEEE International Conference on Bioinformatics and Biomedicine (BIBM) (pp. 4615-4622). IEEE. (CCF-B)
- Zu, Y., **Mi, J.**, Song, L., Lu, S., & He, J. (2023). Finformer: A Static-dynamic Spatiotemporal Framework for Stock Trend Prediction. In 2023 IEEE International Conference on Big Data (BigData) (pp. 1460-1469). IEEE. (CCF-C, CORE B)
- Wang, Z., **Mi, J.**, Lu, S., & He, J. (2023). MultiModal-Learning for Predicting Molecular Properties: A Framework Based on Image and Graph Structures. arXiv preprint arXiv:2311.16666.

Research

ACDNet | *First Author* | *Pytorch, Transformer, GNN*

- Proposed an Attention-guided Collaborative Decision Network for medication recommendation
- Employed attention mechanism and Transformer to effectively capture the health conditions and medication records from electronic health records
- Incorporated a collaborative decision mechanism to provide personalized medication recommendation
- Conducted extensive experiments on both the MIMIC-III and MIMIC-IV datasets, demonstrating state-of-the-art results with our proposed approach

RoKEPG | *Second Author* | *Pytorch, Transformer, BERT*

- Proposed a RoBERTa and Knowledge Enhancement model for Prescription Generation of Traditional Chinese Medicine
- Performed a secondary pre-training of the RoBERTa model based on a TCM domain corpus
- Conducted fine-tuning on the pre-trained RoBERTa model based on the attention mask matrix to introduce the knowledge of herbs for guiding the model to generate TCM prescriptions
- Conducted extensive experiments on publicly available TCM prescription dataset, demonstrating the effectiveness of the RoKEPG model compared with the state-of-the-art related models

Finformer | *Second Author* | *Pytorch, Transformer*

- Proposed a Transformer-based spatiotemporal model for predicting stock trends, integrating temporal and spatialfeatures for more accurate forecasts
- Designed a Static-Dynamic Attention mechanism thatmines the sparse potential dynamic relationships betweenstocks by analyzing historical time series data, and formsspatial embedding of stocks by integrating predefined staticindustry relationships
- Introduced the Gated Fusion mechanism to dynamically integrate temporal and spatial features, enhancing adaptability to stock market variations and allowing flexible emphasis adjustment between spatial and temporal aspects over different periods.
- Compared to the current state-of-the-art baseline models, Finformer model demonstrated significant improvements in performance in the real stock market

MolIG | *Second Author* | *Pytorch, Transformer, GNN, Resnet*

- Proposed a pioneering multimodal pre-training model dedicated to molecular property prediction, and trained the model using both molecular graphs and molecular images as two modalities
- Utilized GNN for molecular graph representation and ResNet for molecular image representation, conducting comparative learning between the two modalities
- Conducted extensive experiments on both the MoleculeNet Benchmark Group and ADMET Benchmark Group, demonstrating that our model can more effectively extract the structural attributes of molecules

Projects

Molecular Generation based on 3D Protein Pockets | *neoX Biotech* | *Pytorch, GNN* May 2023 – August 2023

- Proposed a 3D molecular generation model based on protein pockets
- During the training phase, the pre-trained molecular representation model was incorporated into the molecular generation model to enhance molecular representation
- During the sampling phase, the new molecular encoder was uesed to generate molecules
- Conducted extensive experiments on the Crossdocked dataset, demonstrating that our method surpasses the original approach

TCM Knowledge Graph tool | *Python, Flask, HTML, JavaScript* September 2022 – November 2022

- Developed a Traditional Chinese Medicine knowledge graph tool that can add, delete, modify and query, which is convenient for users to access and maintain the knowledge graph
- This tool used Neo4j to store Chinese medicine knowledge Graph information, used the Flask framework for front-end and back-end interaction, and used HTML and JavaScript for front-end display

Experience

neoX Biotech | *www.neoxbio.com* | *AI Drug Discovery Algorithm Intern* May 2023 – August 2023

- Investigated and tested various protein pocket-based molecular sampling methods
- Investigated and tested various methods based on molecular representation learning
- Attempted to enhance various molecular sampling methods across many datasets to achieve improved performance

Insilico Medicine | *www.insilico.com* | *Bioinformatics Intern* December 2022 – January 2023

- Investigated and tested on hERG ion channel prediction models
- Investigated and tested various methods of molecular fingerprints and graph neural networks to represent molecules