JI QI

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EDUCATION

Yale University, New Haven August, 2021 - June, 2023
M.S. degree in Data Science Pathway, Biostatistics

Sun Yat-sen University (SYSU), Guangzhou September, 2016 - June, 2020
B.S. degree in Mathematics and Applied Mathematics [3.9/4.0 GPA]
Minor: History Studies [4.0/4.0 GPA]

University of California, Berkeley, Berkeley January, 2019 - May, 2019
Exchange Student [3.8/4.0 GPA]

ACADEMIC RESEARCH

Generative Cell-cell Communication Networks Model Development using VAE Framework
Research Assistant [Supervised by Prof. Zuoheng Wang and Prof. Xiting Yan] November, 2021 - Present

- Use a variational graph autoencoder (VGAE) framework to learn the distribution of cell-cell communication networks (CCCNs) in disease and control subjects, and then generate a large number of networks for downstream network comparison.
- Compare networks in disease group and control group based on network centrality, latent space distance, and adjacency spectrum.
- Assess the performance of our method to compare CCCNs between disease and control using the IPF lung cell atlas dataset which measured scRNA-seq in 32 IPF patients and 28 healthy controls.
- Results suggest that VGAE can improve the power to identify disease associated perturbations in CCCNs through learning the distribution of graphs.

Causal Integration of Multi-omics Data With Prior Knowledge
Research Assistant [Supervised by Prof. Xiting Yan and Prof. Richard Pierce] December, 2021 - July, 2022

- Apply Causal Oriented Search of Multi-Omics Space (COSMOS) to our Cardiopulmonary Bypass (CPB) Cohort dataset comprising transcriptomics, metabolomics, and proteomics data from pre-CPB and post-CPB tissues.
- Identify transcriptomic, metabolomic, and proteomic signatures that define acute lung injury (ALI) and its resolution.
- Identify differences in cellular populations and their transcriptional activity associated with ALI.
- Identify causal pathways that connect the changes in multi-omics data and define the disease trajectory, which helps to predict disease outcome and provide novel therapeutic targets in acute lung injury.

Predicting Molecular Properties
Kaggle Featured Prediction Competition August, 2019

- Developed a model for the prediction of interactions between atoms and ranked in top 6% on the public leaderboard out of 2,749 teams.
- Visualized variables from 4.66 million training samples.
- Implemented feature engineering to derive variables pertaining to distances between atoms of molecules, atom type and atom coupling type from preexisting variables.
- Predicted scalar couplings using neural network and tree-based models including LightGbm and XGBoost.

Single-Image Deraining using Improved L_0 Gradient Minimization
Outstanding Undergraduate Thesis [Supervised by Prof. Jia Li] February, 2019 - March, 2020

- Introduced several rain models in single-image rain removal methods and proposed a rain appearance model that integrates multiple rain properties.
- Improved the *guided filter* using a *separate guided filter process* thereby preserving higher levels of detail.
- Proposed an improved L_0 *gradient minimization*-based model with proven convergence to remove more than 80% rain streaks in test images while preserving edges.
- Proposed an improved L_0+L_1-norm based model for heavy rain removal and image smoothing.

Correlation between ESG (Environmental, Social and Governance) Performance and Bond Default Rates
Research Assistant [Supervised by Prof. Yao Wang] January, 2018 - February, 2018

- Used *logistic regression* and *OLS regression* to assess the correlation between ESG performance and bond default rates after examining 305 default bonds and 928 downgrade bonds among 19,244 samples.
- Optimized seller rating and the default warning model (with 89.5% accuracy) subsequent to the integration of ESG variables.

PROFESSIONAL EXPERIENCE

GF Securities Ltd, **Shenzhen**
Equity Research Intern April, 2020 - July, 2021

Ping An Insurance Ltd, **Guangzhou**
Vehicle Insurance Actuary Intern July, 2018 - September, 2018

EXTRACURRICULAR ACTIVITIES

Teaching Assistant, SYSU School of Mathematics September, 2018 - January, 2019
Deputy Head, SYSU Student Society Academics Department September, 2017 - June, 2018
Head of Publicity Department, SYSU Allshare Volunteers Association September, 2017 - June, 2018
Volunteer, Oral History of Guangdong Leprosy Convalescent Program February, 2018 – June, 2020

AWARDS

- *SYSU Merit Student Scholarship*, 2017, 2018, and 2019
- *Bronze Medal* (Top 6%), "Predicting Molecular Properties" Kaggle Competition, 2019
- *SYSU Zhong You Chu Scholarship*, 2018
- *First Place*, RET Technology Innovation Contest, 2018
- *Meritorious Winner* (Top 9%), Mathematical Contest in Modeling (MCM), 2018
- *Second Prize*, China Undergraduate Mathematical Contest in Modeling (CUMCM), 2017
- *SYSU Excellent Volunteer*, 2017
- *First Place*, SYSU Tennis Contest (Team competition), 2016

TECHNICAL AND LINGUISTIC SKILLS

Programming Languages: R , Python, Mathematica, MATLAB, C++, SAS, VBA
Languages: Native in Mandarin and Cantonese with advanced English language facility (TOEFL: 108, GRE: 327)