**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 outcomes 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.

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# Single-Image Deraining using Improved 𝐿0 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 𝐿0 *gradient minimization*-based model with proven convergence to remove more than 80% rain streaks in test images while preserving edges.
* Proposed an improved 𝐿0+𝐿1-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)