HAODONG LING

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Education

School of Data Science, Fudan University <div align="right">**Sep. 2018 – Current**</div>
GPA: 3.61/4.00 <div align="right">*Rank: 21 / 79*</div>

Relevant Coursework

Math

- Linear Algebra
- Probability Theory
- Stochastic Process
- Statistics
- Regression Analysis
- Statistical Learning
- Time Series Analysis
- Optimization
- Bayesian Statistics

Programming

- Computational Statistics
- Principle of Computer Engineering
- Data Structure
- Numerical Algorithm
- Distributed System
- Artificial Intelligence
- Computer Vision

Publication

1. **Haodong Ling**, Haolun Shi, Nan Yuan, Yuan Ji and Xiaolei Lin (2022). *qTPI: A quasi-Toxicity Probability Interval design for Phase I trials with multiple-grade toxicities.* (Submitted to Statistical Methods in Medical Research)

Research Experience

Development of a qTPI Design for Phase I Clinical Trial <div align="right">**Mar. 2022 – Oct. 2022**</div>
Advisor: Prof. Xiaolei Lin, School of Data Science, Fudan University

- Developed a qTPI design for Phase I clinical trial, which fully utilized multiple severity levels and toxicity types.
- Compared operational characteristics between the qTPI design and CRM, BLRM, BOIN, mTPI2 designs. Demonstrated the qTPI design achieved better safety, accuracy and reliability.
- Elaborated the numerical simulation and the hypothetical trial sections of the manuscript. The manuscript has been submitted to Statistical Methods in Medical Research.

Investigation of the effects of chronic stress in UK Biobank <div align="right">**Aug. 2022 – Present**</div>
Advisor: Prof. Xiaolei Lin, School of Data Science, Fudan University <div align="right">*Research Assistant*</div>

- Investigated the association between longitudinal trajectories of chronic stress and peripheral blood distribution.
- Examined the effects of chronic stress on structral / functional brain functions through neuro-imaging derived phenotypes.

Estimation of causal impact of "Shuangjian" policy on adolescent eye health <div align="right">**Dec. 2022– Present**</div>
Advisor: Prof. Xiaolei Lin, School of Data Science, Fudan University <div align="right">*Research Assistant*</div>

- Conducted regression discontinuity design using longitudinal data collected in 2019-2022 from districts, schools and hospitals in Shanghai.
- Found significant causal impact on spherical equivalent.

Detection of cancer from cell-free DNA sequences <div align="right">**May 2021 – Dec. 2021**</div>
Advisor: Dr. Jie Fu, Mila - Quebec AI Institute

- Cooperator: Dr. Yi Zhang from Euler Genomics, Beijing and Dr. Min Lin from Sealab, Singapore.
- Studied topics related to deep learning, especially transformer models and deep reinforcement learning theories.
- Used a pre-trained DNABERT model, added adapter layers, and fine-tuned the model to detect cancers from cell-free DNA sequences.

Stock Market Prediction Based on Sentiment Analysis of reddit Comment <div align="right">**May 2021 – July 2021**</div>
Advisor: Prof. Anand BHOJAN, School of Computing, National University of Singapore

- Cooperator: Jason Ong from University College London.

- Attended the summer workshop in the School of Computing, National University of Singapore. Finished the "AI/ML for Financial Services" course with grade A.
- Used NLP models like Vader and FinBERT to extract sentiment features from reddit comments. Used machine learning models, such as KNN, Random Forest and Long Short-term Memory (LSTM) model to predict stock price. Poster is displayed on website: 🔗 sws.comp.nus.edu.sg

Selected Course Projects

NASA Airfoil Self-noise Prediction | *R, Bayesian model, Markov Chain Monte Carlo method*   **Spring 2022**
- Used Bayesian architecture and constructed hierarchical model for prediction of NASA airfoil self-noise.
- Established several models and conducted model selection. Estimated the model using Markov Chain Monte Carlo (MCMC) method. Evaluated the model by diagnosing the Markov chain's convergence and calculating the mean square error.

Music Recommendation System on KKBOX | *Spark*   **Spring 2022**
- Constructed a distributed music recommendation system on from KKBox Music Data.
- Realized user-based, item-based collaborative filtering algorithms and weighted alternating least square algorithm based on Pyspark. The ALS model achieved highest accuracy of 0.38.
- Analyzed how different parallelism setting affect the performance and discussed the best setting for different data and cluster size.

Computer Vision Course Project | *Pytorch, deep learning, transformer*   **Fall 2021**
- mid-term project: Implemented the Segmentation Transformer (SETR) model using Pytorch on cityscapes dataset for semantic segmentation task, which achieved 60% pixel-wise accuracy.
- final project: Proposed a Hybrid Vision-Transformer model architecture, which merge convolution layers for better feature extraction in the original Vision Transformer (ViT) model. The model achieved 71% accuracy on CIFAR-10 dataset.

Gomoku AI Project | *python*   **Fall 2021**
- Implemented α-β pruning, Monte-Carlo tree search, and multiple reinforcement learning algorithms like SARSA, q learning, REINFORCE, and self-teaching ADP for the Gomoku game.
- Scored over 1500 points on the rating board and beat several classic Gomoku algorithms and most of my classmates' algorithms.

Technical Skills

Programming: R, Python
English:
- TOEFL (104, Reading 29 + Listening 27 + Speaking 22 + Writing 26)
- GRE (323, verbal 153 + Quantitative 170 + Writing 3.5)

Honors / Awards

scholarship 2019-2021: Excellent student scholarship
Contemporary Undergraduate Mathematical Contest in Modeling (CUMCM) 2020: Third Price in Shanghai
The Interdisciplinary Contest in Modeling (ICM) 2021: Honorable Mention