HAN CHENYITENG

Cell Phone: 86-15867068518 | E-mail: hansinxxxxxx@gmail.com | GitHub: Hhnxxxxxx (Charles Han)

EDUCATIONAL BACKGROUND

Rice University, Houston, USA **Aug. 2024 – Present**

- Master of Computational and Applied Math (MCAAM), George R. Brown School of Engineering
- GPA: 4.00/4.00

University of Toronto, Toronto, Canada St. George Campus **Sept. 2020 – Jun. 2024**

- Bachelor of Science, Mathematics Specialist Program, Faculty of Arts and Science
- GPA: 3.22/4.00

RESEARCH EXPERIENCES

Gravitational Waveform Sensitivity Analysis

First Author | Supervisor: Fan Zhang **Aug. 2024 – Jul. 2025**

- Conducted a dual-method sensitivity analysis of gravitational waveforms from binary black hole mergers, focusing on four key parameters: chirp mass, aligned spin, luminosity distance, and inclination angle.
- Implemented Sobol variance decomposition and ANOVA decomposition to quantify global and feature-wise parameter influence.
- Found that spin χ_1z dominates waveform mismatch and peak timing, while distance and inclination primarily control amplitude and energy; chirp mass plays a secondary role through interactions with spin.
- Proposed sensitivity-informed strategies for surrogate modeling and parameter inference in gravitational wave astronomy.
- Authored the paper Understanding Parameter Influence in Gravitational Waveforms: A Dual-Method Sensitivity Analysis, accepted for oral presentation at CISAT 2025 (Kunming, China), to be published in IEEE indexed proceedings.

Graph Learning Research: Citation Link Prediction with LLM Embeddings

Team Leader | Supervisor: Arlei Silva **Jan. – May 2025**

- Worked in a team of three to study citation link prediction using graph neural networks and language models
- Collected 9000 computer science papers from OpenAlex and built a directed citation graph with time-based edge split
- Created node features using both TF-IDF (BoW) and SciBERT embeddings from titles and abstracts, then implemented a two-layer GCN encoder and tested two decoders: dot product and a simple MLP
- Ran experiments comparing different combinations of embeddings and decoders, repeated 50 times for reliability, found that SciBERT with MLP gave the best results
- Analyzed how model performance depends on the match between embeddings and decoder types
- Wrote the final report *Improving Link Prediction on Citation Graphs Using LLMs* and organized the GitHub repo with code, results, and figures at github.com/Hhnxxxxxx/LLM-Link-Prediction

Applied Statistical Modeling: Customer Review Behavior Analysis with R

Solo Project | Supervisor: Rohan Alexander **Mar. – Apr. 2024**

- Analyzed 4,000 customer reviews from a Pizza Hut branch using public Kaggle dataset
- Built logistic regression and multilevel negative binomial models to study how star ratings affect review behavior
- Found that lower ratings are strongly associated with higher likelihood and longer length of text reviews
- Used R for data processing, modeling, and visualization
- Reflected on model limitations and proposed future work using NLP-based methods

- Wrote the final report *Exploring Customer Feedback: A Study of Reviews at Pizza Hut, Sri Lanka* and organized the GitHub repo with code, results, and figures at github.com/Hhnxxxxxx/Pizza-Hut-Reviews.

Applied Mathematics Research: Disease Spread Dynamics Using SCIR Model
Team Leader | Supervisor: Adam R. Stinchcombe **Jan. – Apr. 2024**

- Collaborated with a partner on a project to investigate the spread of infectious diseases using mathematical models
- Developed an enhanced model, the SCIR model, by dividing infected individuals into symptomatic infectives (I) and asymptomatic carriers (C)
- Extended the model to simulate disease spread across multiple cities, incorporating human movement between populations to better reflect real-world scenarios
- Analyzed the potential effectiveness of public health policies, specifically the isolation of symptomatic patients, on controlling disease spread
- Calculated the basic reproduction number (R0) for the SCIR model to quantify the transmission potential of infectious diseases
- Focused on the theoretical establishment of the model, coding simulations, and mathematical derivation of R0. My teammate was responsible for data fitting and subsequent analysis and adjustment of the model
- Completed a paper *Exploring Disease Spread Dynamics: The SCIR Model and the Role of Asymptomatic Carriers* detailing our findings, including comprehensive analysis and simulations and organized the GitHub repo with code, results, and figures at github.com/Hhnxxxxxx/SCIR-Model

Applied Mathematics Research: Linear Algebra and Partial Differential Equations in Multiple Disciplines
Team Leader | Supervisor: Anastasia Romanou **Jun. – Jul. 2023**

- Conducted data processing of water temperature and salinity of the South Pacific Ocean using python, analyzed the data and made predictions over a certain time frame using machine learning methods
- Used python to obtain a numerical solution to the boundary problem of the heat equation and verified the accuracy of the numerical solution against the theoretical solution; used the numerical solution to study the effect of coefficients and variables on the solution and stability
- Finished a paper titled *Finding the Numerical Solution of the One-dimensional Heat Equation*
- In charge of the overall research progress in the team, including outlines writing, plans arrangement, tasks assignment，etc.

Numerical Analysis: Calculus and Algorithmic Modeling Errors
Team Leader | Supervisor: Ming Gu **Jul. – Oct. 2022**

- Developed mathematical strategies and did real-world simulations using python to give optimal solutions to gaming strategy games
- Finished a paper titled *Game Theory -- Optimum Strategy for Drawing Cards in 21 Points* as the co-first author
- In charge of the overall research progress in the team and mainly responsible for coding for each part

INTERNSHIP EXPERIENCE

Government Procurement Cloud Service Platform
Data Analyst Assistant **Jul. – Aug. 2023**

- Did research, integrated the needs of each department, abstracted the revenue, operation, and management models of each department, and then did summarization
- Did weekly statistics on departmental revenue and revenue components related to projects including newspaper, vaccines and government digitization
- In charge of macro longitudinal fitting, detail categorization, side-by-side comparisons, analysis after sifting out large items, analysis in conjunction with previous data curves, and revenue reports
- Wrote test case code

SKILLS

Programming language: Python, java
Data analysis: Python, MATLAB, R, SQL
Mathematics: GeoGebra

LEADERSHIP

Chinese Student Union **Oct. 2020 - Jun. 2022**

- Hosted weekly club meetings and events, as well as multiple large-scale annual events throughout the year