

TIAN, Zhiwen

📍 Year 3 ✉ Email: s230033036@mail.uic.edu.cn 📞 Phone: 18768879382

Education

Beijing Normal University-Hong Kong Baptist University united international college (UIC) Sept 2022 – June 2026

• **Major: BSc in Applied Mathematics** GPA: 3.79/4.0 (Rank 2)

Relevant Courses: Machine Learning, Data mining, Mathematical Modeling, Complex Analysis, Mathematical Analysis, Optimization, ODE, PDE, Applied Statistics, Numerical Analysis, Applied Stochastic Process, Probability Theory, Time Series

• **Minor: BSc in Computer Science and Technology**

Relevant Courses: Bayesian Network, Data Structure and Algorithm, Database, Design Analysis and Algorithm, Compiler, python

Research Experience

The application of causality emergence in cellular networks Feb 2025 - Present

- Model development: Utilized Neural Information Squeeze (NIS) framework to extract coarse-grained strategies from cellular interaction time-series data via protein-protein interaction (PPI) networks.
- Causal quantification: Employed information entropy and singular value decomposition (SVD) to measure causality emergence across micro-macro scales.
- Disease application: Identified abnormal macro-causal modules in rare diseases by comparing cellular network dynamics between patient and control groups.

A Comprehensive Numerical Study of Rotation-induced Traumatic Brain Injury Nov 2024 - Present

Research Assistant

- Read papers on rotation - induced traumatic brain injury to understand cerebrospinal fluid's role
- Analyzed different density ratios and created scatter plots to explore their impact on related factors

Olympic Preparation Technology Research Project: Development of the Third Generation Intelligent June 2024 – Oct 2024

Selection Arrow Equipment and System, Research Assistant

- Test archery experiments, and collect datasets (8 parameters) about the arrow's ejection motion
- Use Python for statistical processing of data and Matlab numerical integration for error estimation
- Built regression models to observe their stability, visualize and analysis how to optimize the selected arrow's machine

Project Experience

2020 U.S. Election Sentiment Analysis, [🔗](#) Core Member Nov 2024

- Processed 1.7M+ tweets with XLNet/TextBlob/Transformer-XLNet, achieving 99.2% data validity
- Mapped polarized sentiment trends aligning with election results

Analysis of Regional Medical Resource Allocation in China, [🔗](#) Core Member Aug 2024

- Predicted 2024–2034 trends via ARIMA/LSTM (MSE: 235.69 vs. 403.28) using 31 provinces' medical data (1990–2023)
- Identified GDP-driven regional disparities through PCA and spatial analysis (KNN-based Moran's I/Spatial Lag Model)

Sex Ratio Effects on Lamprey Ecosystem Dynamics, [🔗](#) Core Member Feb 2024

- Built Lotka-Volterra/TOPSIS/AHP models with 89% growth prediction accuracy
- Identified critical sex ratio thresholds for ecosystem stability

Extracurricular Experience

ITSC department of UIC, Student Assistant Sept 2024 - Present

- Assisted in daily work, provided auxiliary technical support, engaged in project management

UIC, Peer Mentor (Outstanding Peer Mentor Award) Sept 2023 - June 2024

- Provided academic and life guidance for freshmen and established a good teacher-student relationship

UIC W-beE Outdoor Club, Finance Department Officer Sept 2023 - Aug 2024

- Managed financial operations (budgeting, sponsorship, reporting) and organized multiple outdoor events.

Scholarship and Awards

- 2022-2024 First Class Award & Second Class Award Dec 2023 & Dec 2024
- 2024 The Third National Data Analysis Competition for College Students, Second Prize Sept 2024
- 2024 Mathematical Contest in Modeling (MCM), Meritorious Winner (Top 8%) May 2024
- 2023 National Undergraduate Mathematical Contest in Modeling, Third Prize Jan 2024
- 2022-2023 Guangdong Medical Valley Scholarship Dec 2023
- 2023 Shenzhen Cup Mathematical Modeling Challenge, Second Prize Oct 2023

Skills and Hobbies

Technology Skills: python, Latex, Matlab, R , SPSS, Microsoft Office **Hobbies:** Writing, Swimming, Frisbee, Basketball

Language: English (Medium of Instruction, CET-6), Chinese (Mother Tongue)