Qi Zhang

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https://archiezq.github.io/qizhang.github.io/
https://github.com/archiezq

Education

09.2023 – Present
University Van Amsterdam
Master, Computational Science
Courses: *Complex System Simulation, Agent Based Modelling, Machine Learning, Evolutionary Computing, Numerical Algorithms, Stochastic Simulation, Computational Finance, Quantitative Risk Management*

09.2019 – 06.2023
North China Electric Power University
Bachelor, Energy and Power Engineering (Renewable Energy)
Courses: *Fluid Mechanics, Thermodynamics, Heat Transfer, Renewable Energy Techniques, Energy System.*
Thesis: *Thermal Management in Lithium-Ion Batteries Using Immersed Phase Change Materials*

Work Experience

07.2024 – 08.2024
Research Intern, Chinese Academy of Sciences
Designed and built a **Flask-based system** for managing users and alerts, featuring secure authentication, role-based access control, and support for multi-channel notifications (Email, SMS, WeChat). Developed logic for alert deduplication and compression to minimize redundancy and maintain reliability under high load. Deployed **large language models (LLMs)** within the system to interpret alert messages and enhance operational decision-making through intelligent automation.

Research Experience

11.2024 – 07.2025
Thesis: System Dynamics Models of Blood Pressure Regulation, University Van Amsterdam
Developed a physiologically informed computational lumped model that combines **baroreflex and cerebral autoregulation mechanisms** to simulate systemic blood pressure control and cerebral blood flow regulation. The model incorporates **oxygen transport dynamics** and is validated using clinical data from Amsterdam UMC. Key methods include partial differential equations (PDEs), physiological system modeling, and parameter optimization using **evolutionary algorithms**, aiming to enhance understanding of orthostatic hypotension.

01.2024 – 05.2024
Computational Finance and Quantitative Risk Management, University Van Amsterdam
Applied advanced numerical methods and stochastic modeling in financial derivatives pricing and risk assessment. Implemented the **finite difference method** for solving the Black-Scholes PDE and pricing European and American options. Simulated the Heston stochastic volatility model using the Milstein scheme. Employed copula-based Monte Carlo simulations, Principal Component Analysis **(PCA)**, and Factor Analysis to investigate asset dependencies. Built and validated risk models using Value at Risk **(VaR)** and Expected Return **(ER)**. Integrated **machine learning algorithms** (Random Forest, LightGBM) to predict credit default probabilities based on historical market data.

05.2024 – 07.2024
Opinion Polarization: Conformity and Cross-group Contact, University Van Amsterdam
Developed an agent-based model (**ABM**) using Python to analyze the effects of cross-group contact on social polarization. The model features agents interacting within a network and navigating a grid based on individual opinions, conformity levels, and opinion diversity. Polarization is measured by changes in Alteiri entropy. Additionally, conducted global and local sensitivity analyses using the One-Factor-At-a-Time (OFAT) method to determine the impact of various parameters on the model's outcomes.

Skills

Languages — English(C1), Chinese(Native).
Coding — **Python**(Strong), **R**(Intermediate), **Matlab**(Intermediate), **Julia**(Basic) **C**(Basic)
Software — SolidWorks(Strong), COMSOL(Strong), AutoCAD, Tableau, LaTeX
Others. — Git, Linux, HPC, Flask, HTML, SQL, Vue, Springboot

Scholarships and Awards

2022
National First Prize, China Engineering Robotics Competition
University Scholarship 2020-2022, NCEPU.