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Education

09/2023-08/2024 **M.Sc. in Statistics, University College Dublin,** **Ireland**
GPA: 3.73/4.0 (First Class Honours)
Dissertation: *Monte Carlo Simulation of RAFT Polymerization*
Core Modules: Monte Carlo Inference, Stat Network Analysis, Mathematical Statistics, Time Series Analysis, Advanced Predictive Analytics, etc.

09/2019-06/2023 **B.Sc. in Statistics, Beijing Jiaotong University,** **China**
GPA: 3.16/4.0
Dissertation: *Research on Spin Glass System based on Ising Model*
Core Modules: Statistical Analysis of MATLAB, Data Analysis(R), Multivariate Statistical Analysis, Statistical Computation, Physics, etc.

Professional Experience

10/2023-01/2025 **Visiting Student/Researcher, Charles Institute of Dermatology,** **Ireland**
• Developed Monte Carlo simulation models to study polymerization mechanisms and kinetics.
• Enhanced simulation efficiency using algorithm optimization techniques.
Group Website: https://www.wenxinwang.group/staff.html

Research Experience

10/2023-05/2024 *Cyclization and Unequal Reactivity in Step-Growth Linear Polymerization*
We proposed several refinements to Flory's Principle, leading to new mathematical formulations. Through modelling and simulation studies, I demonstrated the reliability of this enhanced theoretical framework.

05/2024-08/2024 **Master's Dissertation**: *Monte Carlo Simulation of RAFT Polymerization*
This project simulated the RAFT polymerization process using stochastic simulation algorithms (SSA) to explore reaction mechanisms. A novel *Quasi-Leaping* algorithm significantly improved computational efficiency, reducing runtime while maintaining accuracy for FRP and DT systems. The findings enhance understanding of polymerization kinetics and support advancements in polymer chemistry.

12/2022-06/2023 **Undergraduate Dissertation:** *Research on Spin Glass System based on Ising Model*
This project examined the classical Ising model and its application to spin glass systems. Using MCMC Metropolis sampling, it simulated phase transitions in ferromagnetic materials, identified critical temperatures, and analyzed properties like magnetization and susceptibility. The study also compared simulated and quantum annealing in the Edwards-Anderson spin glass model, highlighting the advantages of quantum annealing.

05/2021-05/2022 **College Students' Innovative Entrepreneurial Training Plan Program (China):**
Partly unknown nonlinear systems with actuator faults.
Based on previous studies, we introduced fault tolerant control (actuator faults) into partially unknown nonlinear constrained systems with Event-Triggered ADP Tracking Control. The study proved that with the actuator faults, the uniformly ultimately bounded(UUB) of tracking error in the system can still be guaranteed, and the Zeno phenomenon can be avoided by control. Finally, MATLAB simulations

validated the theoretical findings.

12/2021-04/2022 **"Zhengda Cup" The 12th National College Student Market Research and Analysis Competition:** *The investigate the purchase and willingness of commercial endowment insurance of residents in the Yangtze River Delta region of China*. Utilized SPSS to perform regression analysis and significance testing on the data collected by the questionnaire.

Publications

2025 (Preprint) **Yin, H.**, Li, Y., Wang, W., and Lyu, J. *Accelerated stochastic simulation of free radical polymerization through a hybrid algorithm*. https://doi.org/10.26434/chemrxiv-2025-gxj4r

2025 May Li, Y., **Yin, H.**, Yi, S., Lyu, J., and Wang, W. *Beyond Flory's Principle: Cyclization and* Unequal Reactivity in Step-Growth Polymerization, Science Advances. https://doi.org/10.1126/sciadv.adu8884

Skills & Interests

Programming & Tools R, Python, MATLAB, Julia, Excel, SQL, SPSS, C++.

Data Analysis & Modeling Monte Carlo Simulation, Data Mining, Machine Learning, Predictive Analytics, Time Series Analysis, Mathematical Statistics.

Interests Fitness training, Open water diving, Amateur astronomy.

Award

2021 Learning progress scholarship of Beijing Jiaotong University

Extracurricular Roles

Member of the UCD Math Society;
Member of the UCD Physics Society;
Vice Director of BJTU Science and Technology Association;
Member of the Study Section of the BJTU Students Union;
Member of the Astronomy Club of BJTU;
Beijing Metro Volunteers.

Academic Referees

Riccardo Rastelli
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