Yue GUO

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EDUCATION

PhD in Mathematics *National University of Singapore, Singapore*   *2021 - Present*
Supervisor: Qianxiao Li *https://blog.nus.edu.sg/qianxiaoli*

MSc in Mathematics *National University of Singapore, Singapore*   *2019 - 2020*

BSc in Pure and Applied Mathematics *Jilin University, China*   *2015 - 2019*

EXPERIENCE

Data Science Intern *Global Decision Science, American Express, Singapore*   *May - Jul 2025*

- Analyzed fraud data and identified patterns using SQL and PySpark. Developed XGBoost models and engineered new features for POS fraud detection on Google Cloud Platform.

Research Assistant *Department of Mathematics, National University of Singapore, Singapore*   *2020 - 2021*

- Developed and maintained codebase for OnsagerNet using TensorFlow 2, integrating model reduction techniques. Built weather forecasting models and evaluated against baselines.

PROJECTS

Learning-Based ODE Solver *TensorFlow 2*   *2021 - 2022*

- Developed a machine learning-based ordinary differential equation solver (Runge-Kutta scheme) that outperforms classical methods in accuracy.

Parametric Koopman Decomposition *TensorFlow 2, PyTorch*   *2022 - 2024*

- Implemented Koopman-type decompositions for dynamic systems with static or time-varying parameters and achieved improvements on forward predictions control problems for high-dimensional, non-linear systems.

PUBLICATIONS

Learning Parametric Koopman Decompositions for Prediction and Control. *SIAM Journal on Applied Dynamical Systems. https://doi.org/10.1137/23M1604576.*

A Recursively Recurrent Neural Network (R2N2) Architecture for Learning Iterative Algorithms. *SIAM Journal on Scientific Computing. https://doi.org/10.1137/22M1535310.*

Personalized Algorithm Generation: A Case Study in Learning ODE Integrators. *SIAM Journal on Scientific Computing. https://doi.org/10.1137/21M1418629.*

TALKS & PRESENTATIONS

The 14th AIMS Conference *hosted by the American Institute of Mathematical Sciences and NYU Abu Dhabi, Abu Dhabi, United Arab Emirates*   *Dec 2025*

The 13th SIAM Student Chapter Symposium *National University of Singapore, Singapore*   *May 2024*

SINFRA workshop 2023 *hosted by the international IPAL laboratory (CNRS, NUS, A*STAR, Univ Toulouse 3, Toulouse INP, CYU), Toulouse, France*   *Jun 2023*

AWARDS

First Place, Citadel APAC Datathon *Mathematical modelling for traffice police resource allocation*   *Apr 2023*

NRF Research Scholarship *National University of Singapore, Singapore*   *Aug 2021 - Aug 2025*

SKILLS

Programming & Tools: Python (PyTorch, TensorFlow 2, PySpark, Pandas, Scikit-learn, etc.), Matlab, SQL, Git, Google Cloud Platform (Cloud Storage, BigQuery)

Expertise: Deep Learning, Dynamics, Fraud Detection   **Languages:** Mandarin (native), English (professional)