YU TIAN

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EDUCATION

University of Oxford **Oxford, UK**
Ph.D. Mathematics Sep. 2018 - Present
EPSRC Centre for Doctoral Training for Industrially Focused Mathematical Modelling (InFoMM CDT)
- Research Interests: Role extraction, Community Detection and Clustering, Networks and Complex Systems, Data Analysis.

University of Manchester **Manchester, UK**
B.Sc. Mathematics and Statistics (2+2 Dual Degree) Sep. 2016 - Jun. 2018
- First Class Hons.

Beijing Institute of Technology **Beijing, China**
B.Sc. Mathematics (2+2 Dual Degree) Sep. 2014 - Jun. 2016
- GPA 3.8/4.

RESEARCH EXPERIENCE

University of Oxford **Oxford, UK**
PhD Research Project: Role Extraction, Dynamics, and Optimisation on Networks. Oct. 2019 - Present
Supervisors: Prof. Renaud Lambiotte (Oxford), Dr. Alisdair Wallis, Dr. Sebastian Lautz (Tesco).

InFoMM CDT Mini-Project: Inter-District Packaged Gas Optimisation. Jul. - Sep. 2019
Supervisors: Prof. Raphael Hauser (Oxford), Dr. Peter Connard, Dr. Harsida Jenkins (Air Products)
- Formulated the problem of both inventory management and transshipment of products as a mixed integer programming, and reviewed state-of-the-art techniques.
- Proposed several relaxation methods based on Lagrangian relaxation to improve solving efficiency.

InFoMM CDT Mini-Project: Halo Effect and Demand Transfer on Products. Apr. - Jun. 2019
Supervisors: Prof. Renaud Lambiotte (Oxford), Dr. Alisdair Wallis (Tesco).
- Devised a method combining Poisson processes with time series analysis to identify the product relationships from aggregated sales data quantitatively.
- Applied regression techniques, and proposed several validation methods with real data.

University of Manchester **Manchester, UK**
Final Project: Model Selection versus Model Averaging in Gaussian Processes. Feb. - Jun. 2018
Supervisor: Prof. Thomas House
- Proposed to apply model averaging technique, via Monte Carlo method, to the parameter estimation phase, and compared it with the classic model selection in real data (code in Python).

PUBLICATIONS AND PREPRINTS

2. **Y. Tian** and R. Lambiotte. *Unifying information propagation models on networks and influence maximisation.* Phys. Rev. E, 106, 034316, 2022.
1. **Y. Tian**, S. Lautz, A. Wallis and R. Lambiotte. *Extracting complements and substitutes from sales data: a network perspective.* EPJ Data Sci., 10:45, 2021.

ACADEMIC EVENTS

Selected Communications
- **The 4th IMA Conference on The Mathematical Challenges of Big Data**, University of Oxford, UK. (Sep. 2022)
  Contributed talk: Information propagation and influence maximisation on networks.

- **SIAM Workshop on Network Science**[1] (Virtual). (Sep. 2022)
  Contributed talk: Unifying information propagation models on networks and influence maximisation.
- **Conference on Network Sciences (NetSci)** (Virtual), Shanghai, China. (July. 2022)
  Contributed talk: Unifying information propagation models on networks and influence maximisation.
- **Industrial Mathematics in the 21st Century: A cornucopia of unsolved problems**, University of Oxford, UK. (June 2022)
  Talk: Open questions in information propagation on networks.
- **InFoMM Annual Meeting**, University of Oxford, UK. (June 2022)
  Talk: Demand dynamics of interrelated products and further optimisation.
- **SIAM UKIE National Student Chapter Conference**, Edinburgh, UK. (June 2022)
  Contributed talk: Unifying information propagation models on networks and influence maximisation.
- **WINQ Workshop on Complex Dynamical Networks**, Stockholm, Sweden. (June 2022)
- **The 13th International Conference on Complex Networks (CompleNet)** (Virtual), Exeter, UK. (May - June 2022)
  Contributed talk: Information propagation and influence maximisation on networks.
- **Seminar at Technical University of Munich** (Virtual), Munich, Germany. (May 2022)
  Invited talk: Dynamics and optimisation on networks.
- **Seminar at Dartmouth College** (Virtual), Hanover, US. (Jan. 2022)
  Invited talk: Role extraction, diffusion, and optimisation on networks.
- **The 10th International Conference on Complex Networks and their Applications (CNA)**, Madrid, Spain. (Nov. 2021)
  Contributed talk: A general class of diffusion model and its influence maximisation.
- **Conference on Complex Systems (CCS)**, Lyon, France. (Oct. 2021)
  Contributed talk: A network-based approach to extract complements and substitutes from sales data.
- **InFoMM Annual Meeting** (Virtual), University of Oxford, UK. (July 2021)
  Talk: Halo effect and demand transfer in retail.
- **Oxford Network Seminar** (Virtual), University of Oxford, UK. (May 2021)
  Invited talk: Extracting complements and substitutes from sales data: a network perspective.

Study Groups

- **SIAM-IMA Study Group with Industry**, Edinburgh, UK. (Jun. 2021)
  Worked on detecting abnormal performance of wind turbines by machine learning.
- **European Study Group with Industry (ESGI 162)**, Leeds, UK. (Jul. 2020)
  Worked on estimating customer lifetime value in the gaming industry using incomplete data.
- **European Study Group with Industry (ESGI 145)**, Cambridge, UK. (Apr. 2019)
  Worked on deep learning hardening techniques for image classifier.
- **InFoMM UK Graduate Modelling Camp**, Oxford, UK. (Apr. 2019)

TEACHING AND OTHER EXPERIENCE

University of Oxford **Oxford, UK**

Organiser Oct. 2021 - Present

- Oxford Networks Seminar

Tutor Oct. 2021 - Dec. 2021

- Introduction to Statistics, Michaelmas Term 2021

Teaching Assistant Oct. 2019 - Apr. 2020

- Networks, Hilary Term 2020
- Graph Theory, Michaelmas Term 2019

HONOURS AND AWARDS

- EPSRC InFoMM CDT Studentship (fully-funded PhD studentship, 2018 – 2022)
- First Prize in China Undergraduate Mathematical Contest in Modelling (Beijing, 09/2016 & 09/2015)
- First-Class People's Scholarship (5% in academia, 2014-2016)
- National Scholarship (5% in academic, research and other activities, 2014-2015)

[1] Also help with the organisation.

TECHNOLOGY SKILLS

- **Programming:** Proficiency in Python (pandas, numpy, scipy, networkx, statsmodels, scikit-learn etc), MATLAB; Familiarity with R Language, C Language.
- **Optimisation:** MOSEK, Lingo.