

# Zexun Chen

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## EDUCATION

- PhD Mathematics, thesis: "Gaussian Process and its Extensions for Machine Learning and Financial Time Series Analysis", University of Leicester, UK, 2017.  
Supervisors: Prof Alexander Gorban, Dr Bo Wang.
- BSc Mathematics and Applied Mathematics, thesis: "The study of Fourth-order Sturm-Liouville Eigenvalue Problems with Dirichlet Boundary Condition", Shandong University, China, 2013.

## ACADEMIC APPOINTMENTS

- 2021– University of Edinburgh Business School, Edinburgh, UK  
Lecturer/Assistant Professor in Predictive Analytics
- 2019–21 Department of Computer Science, College of Engineering, Mathematics and Physical Sciences, University of Exeter, UK  
Postdoctoral Research Associate in US Army project "Identification of Human Mobility Modes using Socio-Spatio-Temporal Predictive Models"
- 2020 –20 Department of Computer Science, College of Engineering, Mathematics and Physical Sciences, University of Exeter, UK  
Lecturer in Computer Science
- 2017–19 Department of Informatics, University of Sussex, UK  
Research Fellow in EPSRC project " EthicalML: Injecting Ethical and Legal Constraints into Machine Learning Models"

## RESEARCH AREAS

Probabilistic machine learning, Bayesian non-parametric predictive models and their applications, e.g. Gaussian Process and its extensions and applications

Time series forecasting, financial data analysis, quantitative risk management

Ethical machine learning, fairness, privacy and transparency in machine learning

Social network, human mobility and urban planning

## PUBLICATIONS

### Articles in Peer-Reviewed Journals

- 2021 Zexun Chen, Sean Kelty, Alexandre G Evsukoff, Brooke Foucault Welles, James Bagrow, Ronaldo Menezes, and Gourab Ghoshal. Contrasting social and non-social sources of predictability in human mobility. *Nature Communications*, 13(1):1–9, 2022
- 2021 Yangtao Li, Tengfei Bao, Zexun Chen, Zhixin Gao, Xiaosong Shu, and Kang Zhang. A missing sensor measurement data reconstruction framework powered by multi-task Gaussian process regression for dam structural health monitoring systems. *Measurement*, page 110085, 2021a
- 2021 Yangtao Li, Tengfei Bao, Hao Chen, Xiaosong Shu, Zexun Chen, Yuhan Hu, et al. A large-scale sensor missing data imputation framework for dams using deep learning and transfer learning strategy. *Measurement*, page 109377, 2021b
- 2020 Yangtao Li, Tengfei Bao, Xiaosong Shu, Zexun Chen, Zhixin Gao, and Kang Zhang. A hybrid model integrating principal component analysis, fuzzy C-means and Gaussian process regression for dam deformation prediction. *Arabian Journal for Science and Engineering*, pages 1–14, 2020
- 2020 Thomas Kehrenberg, Zexun Chen, and Novi Quadrianto. Tuning fairness by balancing target labels. *Frontiers in Artificial Intelligence*, 3:33, 2020. URL <https://doi.org/10.3389/frai.2020.00033>
- 2019 Zexun Chen, Bo Wang, and Alexander N Gorban. Multivariate Gaussian and Student-t process regression for multi-output prediction. *Neural Computing and Applications*, pages 1–24, 2019
- 2018 Zexun Chen and Bo Wang. How priors of initial hyperparameters affect Gaussian process regression models. *Neurocomputing*, 275:1702–1710, 2018

### Journal Article Manuscripts Under Review

- 2022 Diogo Pacheco, Marcos Oliveira, Zexun Chen, Hugo Barbosa, Brooke Foucault-Welles, Gourab Ghoshal, and Ronaldo Menezes. Predictability states in human mobility. *arXiv preprint arXiv:2201.01376*, 2022
- 2021 Zexun Chen, Jun Fan, and Kuo Wang. Remarks on multivariate Gaussian process. *arXiv preprint arXiv:2010.09830*, 2020

### INVITED TALKS

- 2020 ‘Probabilistic modelling: Gaussian Process for Machine Learning.’ The 3rd DUT Xinghai International Forum for Young Scholars, Dalian University of Technology (DUT), online webinar, China. June.
- 2019 ‘Gaussian Process for Machine Learning.’ Shandong University, Weihai, China. December.
- 2015 ‘How Priors of Initial Hyperparameters affect Gaussian Process Regression Model.’ The 38th Research Students’ Conference in Probability and Statistics. Leeds, UK. August.

## GRANTS AND AWARDS

### Awards and Honours

- 2018 **Exceptional Promise**, endorsed by Tech Nation and issued Tier 1 Exceptional Visa (UK)
- 2014 **Outstanding Bachelor Thesis**, Shandong Provincial Education Department, China
- 2013 **Bronze Award (Provincial Outstanding Award)**, “Challenge Cup” National Undergraduate Entrepreneur Business Plan Competition

### Grants and Fellowships

- 2022 Determinants of Collaboration level on Github (\$6, 000). Open-Source Complex Ecosystems and Networks (OCEAN) Award, Vermont Complex Systems Center at the University of Vermont, Co-PI with Dr Tong Wang.
- 2021 Interpretable and Scalable Data-Driven Models in Financial Time Series Analysis. First Grant Venture Fund, University of Edinburgh Business School, PI.
- 2020 Bank Credit Management towards Small and Micro Enterprises using Financial Big Data. Industrial Grant, Bank of Rizhao, Shandong, China, Co-PI.

## TEACHING EXPERIENCE

### The University of Edinburgh, UK

CMSE11206 Business Statistics (Postgraduate)

CMSE11427 Web and Social Network Analytics (Postgraduate)

### University of Exeter, UK

ECM1400, Programming

ECM1407, Social and Professional Issues of the Information Age

ECM1413, Computer and Internet

### edX.org, online

MicroMasters Program in Predictive Analytics using Python

## PROFESSIONAL SERVICE AND MEMBERSHIP

### Journal Peer Review

*IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*

*Pattern Recognition*

*Technometrics*

*Engineering with Computers*

*Environmental Modelling & Software*

*Transportation Research Part C: Emerging Technologies*  
*Neural Computing and Applications*  
*Applied Sciences*

**Conference Review**

*Association for the Advancement of Artificial Intelligence (AAAI)*

**Service to Field**

Committee Member of Royal Statistical Society Young Statisticians Section.

**Membership**

Member of London Mathematical Society (IMS)  
Member of Institute of Mathematics and its Applications (MIMA)  
Member of International Statistical Institute (ISI)  
Data Analyst / Fellow of Royal Statistical Society (RSS)

**TECHNICAL SKILLS**

**IT Skill**

*Programming Languages:* Matlab, C++, Python (TensorFlow, PyTorch), R, Lingo, Maple, Mathematica, Origin, etc  
*Version Control:* SVN, Git  
*Cloud Platform:* AWS EC2  
*Office Software:* Word, Latex

**Data Skill**

*Data Visualisation:* Excel, R, Plotly, Tableau, etc  
*Data Analysis:* Excel (VBA), R, Matlab, SPSS, etc.

**Language**

Fluent English user and native speaker of Chinese (Mandarin and Shanghaiese)

Updated April 2022