

# Dr. Ge Zheng

Research Associate  
Institute of Manufacturing  
Department of Engineering  
University of Cambridge  
Alan Reece Building, 17 Charles Babbage Rd  
Cambridge CB3 0FS ☎ +44 07513627614  
✉ gz305@cam.ac.uk

## Current Employment and Teaching Experience

### Current Employment

03/2022-Now **Research Associate, Institute of Manufacturing, Department of Engineering, University of Cambridge, CB3 0FS, UK.**

*Group:* Supply Chain AI lab (SCAIL)

*Website:* <https://www.ifm.eng.cam.ac.uk/research/supply-chain-ai-lab/>

*Project:* Collective Learning for Supply Chain Disruption Prediction

*Project Description:* With the nature of dependencies in supply chains, collaborations among supply chain members is desired for supply chain risk management. However, data privacy and security concerns bring challenges to the collaboration of supply chain members. This project aims to address these challenges by using collective learning (i.e., Federated Learning) that allows information sharing among supply chain members but without real-world data exchanges, to predict supply chain risks and contribute to supply chain risk management.

#### Interested areas:

- Supply Chain Risk Analysis
- Intelligent Transport Systems
- Human Activity Recognition
- Data Science
- Machine Learning, Deep Learning, Collective learning

### Current Teaching

09/2023-Now **Lecturer for two modules: MET-IIB-5 and ISMM-M3, Institute of Manufacturing, Department of Engineering, University of Cambridge, CB3 0FS, UK.**

- MET-IIB-5 module: The full name of this module is Data and Decision Science for 4th Year undergraduate students in Manufacturing Engineering Tripos. My role here is to give lectures regarding data mining.
- ISMM-M3 module: The full name of this module is Data and Modelling for MPhil students in Industrial Systems, Manufacture and Management. My role here is to give lectures regarding neural networks.

05/2023-Now **Supervisor for both master and undergraduate students, Institute of Manufacturing, Department of Engineering, University of Cambridge, CB3 0FS, UK.**

- Supervising MET undergraduate students for their final projects.
- Supervising MPhil students for their final project.

## Previous Education

09/2018-02/2022 **Full-time PhD Student, Department of Computing & Informatics, Faculty of Science & Technology, Bournemouth University, BH12 5BB, UK.**

#### Full PhD Scholarship

*Project Title:* Deep Learning Models for Traffic Prediction in Urban Transport Networks.

*Project Description:* This project is motivated by relieving traffic congestion and reducing travel time and traffic accidents in urban areas. It aims to predict future traffic status in urban transport networks using deep learning algorithms and share the predicted traffic status with road users and intelligent transportation systems for relieving traffic congestion and reducing long travel time and traffic accidents.

10/2017-09/2018 **M.Sc. in Electronic Engineering, School of Computer Science & Electronic Engineering, University of Essex, CO4 3SQ, UK.**

#### Academic Excellence International Masters Scholarship

*Project:* A Smart Wristband Development for Fall Detection.

*Project Description:* This project is motivated by helping old people obtain timely help when they fall due to the mobility problems. It aims to use machine learning algorithms to detect falls from daily activities.

M.Sc. degree was awarded with **Distinction** in October 2018.

09/2011- **BEng in Mechatronics, Henan University of Science & Technology, China.**  
07/2015 BEng degree was awarded in July 2015.

GPA : 84.51/100

---

## Publications

### Journal Articles

- 2024 **Zheng, Ge**, Dmitry Ivanov, and Alexandra Brintrup. Learning to learn: Network formation and clustering for federated machine learning in supply chains. *International Journal of Production Research*. Taylor & Francis, **Under review**, 2024.
- 2024 **Zheng, Ge**, Sara Almahri, Stefan Schoepf, Maria Minaricova, and Alexandra Brintrup. Large language models for supply chain management: An exploratory study in risk management. *International Journal of Production Research*. Taylor & Francis, **Under review**, 2024.
- 2024 Assemgul Kozhabek, Wei Koong Chai, and **Zheng, Ge**. Modeling traffic congestion spreading using a topology-based sir epidemic model. *IEEE Access*. IEEE, 2024.
- 2024 Lingxuan Kong, **Zheng, Ge**, and Alexandra Brintrup. A federated machine learning approach for order-level risk prediction in supply chain financing. *International Journal of Production Economics*, volume 268, page 109095. Elsevier, 2024.
- 2024 Chen Chen, Manuel Herrera, **Zheng, Ge**, Liqiao Xia, Zhengyang Ling, and Jiangtao Wang. Cross-edge orchestration of serverless functions with probabilistic caching. *Transactions on Services Computing*, 2024.
- 2023 Yi Xiong, Wei Lv, Xiao-qin Zha, Yong Li, Ze-wei Luan, Tian-tian He, Kang-hao Shu, Feng-zhang Ren, and **Zheng, Ge**. Surface nano-crystallization and its effect on the microstructure evolution and mechanical properties of lightweight fe-28mn-8al-1c steel subjected to supersonic fine particle bombardment. *Journal of Materials Research and Technology*. Elsevier, 2023.
- 2023 Yan Wang, Xin Wang, Hongmei Yang, Yingrui Geng, Hongnian Yu, **Zheng, Ge**, and Liang Liao. Mhagnn: A novel framework for wearable sensor-based human activity recognition combining multi-head attention and graph neural networks. *IEEE Transactions on Instrumentation and Measurement*. IEEE, 2023.
- 2023 Yan Wang, Xin Wang, Damla Arifoglu, Chenggang Lu, Abdelhamid Bouchachia, Yingrui Geng, and **Zheng, Ge**. A survey on ambient sensor-based abnormal behaviour detection for elderly people in healthcare. *Electronics*, volume 12, page 1539. MDPI, 2023.
- 2023 **Zheng, Ge**, Lingxuan Kong, and Alexandra Brintrup. Federated machine learning for privacy preserving, collective supply chain risk prediction. *International Journal of Production Research*, pages 1–18. Taylor & Francis, 2023.
- 2023 **Zheng, Ge**, Wei Koong Chai, Jiankang Zhang, and Vasilis Katos. Vdgcnet: A novel network-wide virtual dynamic graph convolution neural network and transformer-based traffic prediction model. *Knowledge-Based Systems*, page 110676. Elsevier, 2023.
- 2023 **Zheng, Ge**, Wei Koong Chai, Jing-Lin Duanmu, and Vasilis Katos. Hybrid deep learning models for traffic prediction in large-scale road networks. *Information Fusion*, volume 92, pages 93–114. Elsevier, 2023.
- 2023 Alexandra Brintrup, Edward Kosasih, Philipp Schaeffer, **Zheng, Ge**, Guven Demirel, and Bart L MacCarthy. Digital supply chain surveillance using artificial intelligence: definitions, opportunities and risks. *International Journal of Production Research*, pages 1–22. Taylor & Francis, 2023.
- 2022 **Zheng, Ge**, Wei Koong Chai, and Vasilis Katos. A dynamic spatial-temporal deep learning framework for traffic speed prediction on large-scale road networks. *Expert Systems with Applications*, volume 195, page 116585. Elsevier, 2022.
- 2021 **Zheng, Ge** and Zhijun Peng. Life cycle assessment (lca) of bev’s environmental benefits for meeting the challenge of icexit (internal combustion engine exit). *Energy Reports*, volume 7, pages 1203–1216. Elsevier, 2021.
- 2021 **Zheng, Ge**, Wei Koong Chai, Vasilis Katos, and Michael Walton. A joint temporal-spatial ensemble model for short-term traffic prediction. *Neurocomputing*, volume 457, pages 26–39. Elsevier, 2021.
- 2021 **Zheng, Ge**. A novel attention-based convolution neural network for human activity recognition. *IEEE Sensors Journal*, volume 21, pages 27015–27025. IEEE, 2021.

## Conference Papers

- 2023 Liqiao Xia, Pai Zheng, Yongshi Liang, **Zheng, Ge**, and Zhengyang Ling. Secure co-creation of industrial knowledge graph: Graph complement method with federated learning and chatgpt. In *2023 IEEE 19th International Conference on Automation Science and Engineering (CASE)*, pages 1–6. IEEE, 2023.
- 2021 **Zheng, Ge**, Wei Koong Chai, and Vasilis Katos. The sequence-to-sequence architecture with an embedded module for long-term traffic speed forecasting with missing data. In *2021 26th International Conference on Automation and Computing (ICAC)*, pages 1–6. IEEE, 2021.
- 2019 Michael Walton, John Woods, and **Zheng, Ge**. Efficient charging for batteryless solutions in energy harvesting. In *2019 11th Computer Science and Electronic Engineering (CEECE)*, pages 7–11. IEEE, 2019.
- 2019 **Zheng, Ge**, Hongtao Zhang, Keming Zhou, and Huosheng Hu. Using machine learning techniques to optimize fall detection algorithms in smart wristband. In *2019 25th International Conference on Automation and Computing (ICAC)*, pages 1–6. IEEE, 2019.
- 2019 **Zheng, Ge**, Wei Koong Chai, and Vasilis Katos. An ensemble model for short-term traffic prediction in smart city transportation system. In *2019 IEEE Global Communications Conference (GLOBECOM)*, pages 1–6. IEEE, 2019.

## Best Conference Paper Award

- 2021 **Zheng, Ge**, Wei Koong Chai, and Vasilis Katos, The Sequence-to-Sequence architecture with An Embedded Module for Long-Term Traffic Speed Forecasting with Missing Data, In *IEEE 26th International Conference on Automation and Computing (ICAC)*, 2021..

---

## Previous Employment

- 2022 Visit Lecturer and Lab Assistant, Department of Computing and Informatics, Bournemouth University.
- Artificial Intelligence Module: given lectures regarding artificial intelligence to Master students.
  - Computer Fundamentals Module: given helps when students conducted experiments in labs.
- 2020-2021 Visit Lecturer and Lab assistant, University of Bedfordshire.
- Dynamics, Measurement and Control module: given lectures regarding artificial intelligence to master students and also given support when they conducted experiments in labs.
  - Sustainable Energy Technologies module: given lectures to master students.
- 2019 Lab assistant, Digital Forensics Fundamentals Unit, Bournemouth University.
- Digital Forensics Fundamentals Unit module: providing support for master students when they conducted experiments in labs.
- 2016-2017 Tutor, Web International English Ltd, Beijing, *China*.
- Teaching English and managing course schedules.

---

## Honors & Awards

- 2021 Best Conference Paper Award, in the 26<sup>th</sup> International Conference on Automation and Computing (ICAC'21).
- 2018-2022 Full PhD Studentship from Bournemouth University in UK.
- 2017 Academic Excellence International Masters Scholarship from the University of Essex in UK.
- 2014-2015 Second Class Scholarship Prize from Henan University of Science & Technology in China.
- 2014 National 3-D CAD Certification in China.
- 2013-2014 First Class Scholarship Prize from Henan University of Science & Technology in China.
- 2013-2014 Prize of Outstanding Student from Henan University of Science & Technology in China.
- 2012-2013 First Class Scholarship Prize from Henan University of Science & Technology in China.
- 2012-2013 Prize of Outstanding Student from Henan University of Science & Technology in China.
- 2012 Third Class Prize in the Speech Contest from Henan University of Science & Technology in China.
- 2011-2012 National Scholarship Inspirational from Henan University of Science & Technology in China.
- 2011-2012 Prize of Outstanding Student from Henan University of Science & Technology in China.

---

## Professional Activities

- 03-2024 Attending AI UK 2024 hosted by Alan Turing.
  - Demonstrated a demo for my research group, SCAIL.
- 07-2023 Attending Alan Turing Workshop 2023.
  - Given a presentation on using adaptive federated learning for information sharing among supply chain members under data privacy protection.
- 03-2023 Attending AI UK 2023 hosted by Alan Turing.
  - Demonstrated a demo for my research group, SCAIL.
- 11-2022 Attending the event of Digital Manufacturing Week 2022 in Liverpool.
- 10-2022 Giving a seminar about Machine Learning in Engineering at Imperial College London..
- 09-2021 IEEE International Conference on Automation and Computing, *in Portsmouth, UK*.
  - Given a presentation regarding using sequence-to-sequence model and graph convolution neural network for long-term traffic prediction in urban transport networks.
- 12-2019 IEEE Global Communications Conference, *in Wailoloa, Hawaii, USA*.
  - Given a presentation regarding short-term traffic prediction using ensemble machine learning models.
- 09-2019 IEEE International Conference on Automation and Computing, *in Lancaster University, UK*.
  - Given a presentation regarding using machine learning models for fall detection.
- 09-2019 Secondment IDEAL CITIES project, *in Cablenet Communication Systems Lt.d. in Cyprus*.
  - Conducted a secondment and also given a presentation.
- 05-2019 SciTech PGR Conference 2019, *at Bournemouth University, U.K*.
  - Given a presentation about traffic prediction using ensemble machine learning models.

---

## Academic Activities

- 2023–now Being a reviewer for *International Journal of Production Research*.
- 2021–now Being a reviewer for *IEEE Sensors Journal*.
- 2021–now Being a reviewer for *IEEE Access*.
- 2021 Being a reviewer for *IEEE 26<sup>th</sup> International Conference on Automation and Computing (ICAC)*.
- 2020–now Being a reviewer for *IET Intelligent Transport Systems*.
- 2020–now Being a reviewer for *IEEE Global Communication Conference*.
- 2020–now Being a reviewer for *International Journal of Automation and Computing (IJAC)*.

---

## Computer skills

- Programming Languages: Python including the frameworks of PyTorch (mainly used now), TensorFlow and Keras; SQL; MatLab; basic C and C++ (Learned from my BEng and M.Sc. degrees but not used very often after).
  - Python Libraries: NumPy, Pandas, Scikit-learn, Scipy, Matplotlib, Seaborn, NetworkX, Folium, LangChain (for developing applications powered by language models).
  - Machine learning models: K-Nearest Neighbours (KNN), Naive Bayes (NB), Association Rule Learning (ARL), K-means, Support Vector Machine (SVM), Random Forest (RF), AutoRegresive Integrated Moving Average (ARIMA), Linear Regression (LR).
  - Deep Learning models: Artificial Neural Network (ANN), Convolution Neural Network (CNN), Long-Short Term Memory (LSTM), Gated Recurrent Unit (GRU), Recurrent Neural Network (RNN), Sequence-to-Sequence (Seq2Seq), Graph Convolution Neural Network (GCN), Transformer, Attention Mechanism.
- Software: Docker; Microsoft Azure Data Studio; Visual Studio Code; PyCharm; Anaconda; MATLAB; Microsoft Office; Latex (All my publications were written using Latex).
- Operating Systems : Windows, Linux (Ubuntu), Mac OS.