





JianxinZhao

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 in://jzstark
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languages

Chinese (native)
English (fluent)
Japanese
(intermediate)

programming

Python, OCaml, C
Git, Vim

Education

- 2015-2020 **Ph.D.** in Computer Science [University of Cambridge, UK](#)
Thesis: *Optimisation of a modern numerical library: a bottom-up approach*
Supervisor: Prof. Jon Crowcroft
- 2013-2015 **Master** in Software Engineering [Beijing Institute of Technology, CN](#)
- 2013 **Student Exchange Programme** [Karsruhe Institute of Technology, DE](#)
Finish bachelor thesis based on KIT-Horus, an open-source software toolset that facilitates the development of process-oriented information systems.
- 2009-2013 **Bachelor** in Software Engineering [Beijing Institute of Technology, CN](#)

Work

- 2021.01- **Postdoctoral Researcher** [Beijing Institute of Technology, CN](#)
2023.02 Main research topic: distributed machine learning, edge computing

Open Source Project

- 2016-Now **Owl-OCaml Scientific and Engineering Computing** <https://ocaml.xyz>
Owl is a dedicated system for scientific and engineering computing. It is based on the OCaml programming language, and is widely recognised and used in the OCaml community. I have worked as a core developer and maintainer on this project since its inception around 2016.

Books

- 2022.05 **OCaml Scientific Computing: Functional Programming in Data Science and Artificial Intelligence** [Springer International Publishing](#)
Liang Wang, Jianxin Zhao, and Richard Mortier. Springer Nature, 1st ed. 2022 edition, 381 pages. Included in Springer's "Undergraduate Topics in Computer Science" series ([link](#)).
This book covers a wide range of topics in scientific computing:
 - Part I introduces basic numerical techniques, including statistics, linear algebra, ordinary differential equations and signal processing.
 - Part II shows advanced numerical optimisation techniques: algorithmic differentiation, optimisation and regression, and deep neural network.
 - Part III includes a range of computer vision case studies.
- 2022.12 **Architecture of Advanced Numerical Analysis Systems** [Apress](#)
Liang Wang and Jianxin Zhao. Apress Open Access. 1st ed. 2022, 472 pages. ([link](#))
Based on our hands-on experience in developing the Owl library, this book aims to present the architecture design and optimisation of various core components in a modern numerical library.

Awards

- 2021 **Postdoctoral International Exchange Program Scholarship**,
Awarded to excellent international young scientists holding a PhD degree pursuing postdoctoral research in a Chinese university.
- 2015 **China Scholarship Council (CSC) Scholarship**,
Full Scholarship including tuition fee. Awarded to top students to pursue Ph.D. degree abroad.

Communication Skills

- 2019 **Oral Presentation**, *ICFP OCaml 2019, Berlin*
"Executing Owl Computation on GPU and TPU".
Present the research on functional programming and optimising computation I have conducted during my PhD study.
- 2018 **Oral Presentation**, *ACM Open IoT Day, Munich*
"Data Analytics Service Composition and Deployment on IoT Devices".
- 2017 **Oral Presentation**, *EuroSys'17 Doctoral Workshop, Belgrade*
"Towards Security in Distributed Home System".
- 2017 **Poster**, *SOSP 2017, Shanghai*
"User-centric Composable Services for Personal Data Analytics".
I present a system that provides user-centric, ML-based services, which enables service pulling, sharing, compatibility checking, and composing on local devices.

Activities

- 2016-2017 **STIMULUS Programme**, *Cambridge, UK*
Teaching Assist at the Milton Road Primary School
STIMULUS is a community service programme which gives Cambridge University students the opportunity to work with pupils in local schools, helping with Maths, Science, Computing or Technology lessons.
- 2017 **UK University Kendo Taikai 2017**, *Cambridge, UK*
Participate in organising a national sports event
The university taikai is a grand gathering of UK university students practising Kendo, a Japanese martial art.
- 2016 **Undergraduate Supervision**, *Computer Lab, University of Cambridge*
Computer Networking, Michaelmas term 2016.

Publications

Journals

- Participant Selection for Federated Learning With Heterogeneous Data in Intelligent Transport System Jianxin Zhao, Xinyu Chang, Yanhao Feng, Chi Harold Liu, Ningbo Liu
IEEE Transactions on Intelligent Transportation Systems (2022). IEEE, 2022
- Energy-efficient client selection in federated learning with heterogeneous data on edge Jianxin Zhao, Yanhao Feng, Xinyu Chang, Chi Harold Liu
Peer-to-Peer Networking and Applications (2022) pp. 1–13. Springer, 2022
- Energy-Efficient and Fair IoT Data Distribution in Decentralized Federated Learning Jianxin Zhao, Yanhao Feng, Xinyu Chang, Peng Xu, Shilin Li, Chi Harold Liu, Wenke Yu, Jian Tang, Jon Crowcroft
IEEE Transactions on Network Science and Engineering (2022). IEEE, 2022

Parallel and Memory-Efficient Distributed Edge Learning in B5G IoT Networks Jianxin Zhao, Pierre Vandenhove, Peng Xu, Hao Tao, Liang Wang, Chi Harold Liu, Jon Crowcroft
IEEE Journal of Selected Topics in Signal Processing (2022) pp. 1–12. 2022

Federated Learning with Heterogeneity-Aware Probabilistic Synchronous Parallel on Edge Jianxin Zhao, Rui Han, Yongkai Yang, Benjamin Catterall, Chi Harold Liu, Lydia Y Chen, Richard Mortier, Jon Crowcroft, Liang Wang
IEEE Transactions on Services Computing (2021). *IEEE*, 2021

Energy-efficient event detection by participatory sensing under budget constraints Chi Harold Liu, Jianxin Zhao, Honggang Zhang, Song Guo, Kin K Leung, Jon Crowcroft
IEEE Systems Journal 11.4 (2016) pp. 2490–2501. *IEEE*, 2016

A survey of incentive mechanisms for participatory sensing Hui Gao, Chi Harold Liu, Wendong Wang, Jianxin Zhao, Zheng Song, Xin Su, Jon Crowcroft, Kin K Leung
IEEE Communications Surveys & Tutorials 17.2 (2015) pp. 918–943. *IEEE*, 2015

Conferences

Privacy-preserving machine learning based data analytics on edge devices Jianxin Zhao, Richard Mortier, Jon Crowcroft, Liang Wang
Proceedings of the 2018 AAAI/ACM Conference on AI, Ethics, and Society, 2018

Data analytics service composition and deployment on edge devices Jianxin Zhao, Tudor Tiplea, Richard Mortier, Jon Crowcroft, Liang Wang
Proceedings of the 2018 Workshop on Big Data Analytics and Machine Learning for Data Communication Networks, 2018

Energy-efficient dynamic event detection by participatory sensing Jianxin Zhao, Chi Harold Liu, Min Chen, Xue Liu, Kin K Leung
2015 IEEE International Conference on Communications (ICC), 2015

Interests

professional: numerical computing, machine learning, system optimization, deep learning compiler

personal: Kendo, reading, biking, guitar