# Dr. Kai Zhang

Research Scientist in Energy & Transport


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kaiattum.github.io/online-cv/

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kaiATtum

Resume PDF


## CAREER PROFILE

I am currently a research scientist at Institute of High Performance Computing (IHPC), Agency for Science, Technology and Research (A*STAR), Singapore.

- Advanced knowledge in data analytics, numerical modelling & optimisation
- 8 years R&D experience in energy and transport sector
- Led and delivered 3 research projects and 1 industry project
- 20+ publications in top-tier journals and conferences

## EDUCATION

**Ph.D. in Energy Ecnomics** 2016 - 2020
Technical University of Munich

Doctorate study in energy economics forusing on energy system modeling, pricing mechanisms, game theory

- Dissertation: Spot Pricing Principles in Distribution Grids: From Local Market Organization to Multi-regional Coordination
- Advisor: Prof. Dr. Thomas Hamacher

**MSc in Electrical Engineering** 2013 - 2016
Technical University of Munich

Master courses focusing on embeded system and control engineering

- Master Thesis: "Charging Demonstrator for Ancillary Service Provision in Smart Grids"
- Advisor: Prof. Dr. Thomas Hamacher

**BSc in Electrical Engineering** 2010 - 2013
University of Duisburg-Essen

Bachelor courses focusing on nano engineering and information technology

- Bachelor Thesis "Überprüfen und Entwicklung des PowerModuls 2.0 (Validation and development of power moduals 2.0)"
- ADVISOR: Prof. Dr. Roland Schmechel

## EXPERIENCES

**Scientist** 2022 - Present
Agency for Science, Technology and Research (A*STAR), Singapore

Sceintist in energy and transport domain, conducting research on topics in energy system planning, operation, simulation and optimisation model development. Role includes:

- Principle investigator - Project "Optimisation for battery swapping station integration in electricity market"
- Contributor - Project "SITEM - Singapore Integrated Transport and Energy Model"

**Research Fellow** 2020 - 2022
Tumcreate Ltd, Singapore

Project lead for project "Platform for Integrated Microgrid Operation"

- Project conceptualisation, planning & management
- Research in networked microgrids studies & model development & software architecture design & development
- Managed a team of 5 researchers from Tumcreate, EDF singapore, SIT & NTU
- Supervision of internships & junior researchers

**Research Associate** 2015 - 2020
Tumcreate Ltd, Singapore

Researcher in electricity distribution system modeling & distributed optimisation, market mechanisms and game theory

- Supervision of 7 master thesis
- Publication of 10+ scientic papers, book chapters

**Student employee** 2014 - 2015
Infineon Technology, Germany

Software development for object detection (reverse engineering department)

**Intern** 2012 - 2013
HELLA, Germany

Software development for driving assistance system

## PROJECTS

### LANGUAGES

Chinese (Native)

English (Professional)

German (Professional)

### INTERESTS

Trecking

Skiing

Cooking

### ABOUT THEME

How to use?

Star

Complete list

BSCS - Business models development and validation for battery swapping station integration into Singapore electricity market.

SITEM - SITEM - Singapore Integrated Transport and Energy Model

PRIMO - Platform for Integrated Microgrid Operation

MESMO - Open-source Platform for Multi-Energy System Modelling & Optimisation

## PUBLICATIONS

Only selected articles and book chapters are listed.

- A Framework for Multi-Regional Real-Time Pricing in Distribution Grids
*K, Zhang, S. Hanif, C. M. Hackl and T. Hamacher*
IEEE Transactions on Smart Grid, vol. 10, no. 6, pp. 6826-6838, Nov. 2019

- Decomposition and Equilibrium Achieving Distribution Locational Marginal Prices Using Trust-Region Method
*S. Hanif, K, Zhang, C. M. Hackl, M. Barati, H. B. Gooi and T. Hamacherr*
IEEE Transactions on Smart Grid, vol. 10, no. 3, pp. 3269-3281, May 2019

- Coordinated Market Design for Peer-to-Peer Energy Trade and Ancillary Services in Distribution Grids
*K, Zhang, S. Troitzsch, S. Hanif and T. Hamacher*
IEEE Transactions on Smart Grid, vol. 11, no. 4, pp. 2929-2941, July 2020

- Transactive energy in an urban environment: A case study of local generation and flexibility potentials in a Singaporean urban district
*K, Zhang, S. Troitzsch, S.-Y. Zhang, E. S. P. Teh, L. Subramanian, and T. Massier*
Frontiers in Energy Research, vol. 9, Frontiers, Mar. 2021, ISSN: 2296-598X

- Distributionally Robust Co-optimized Offering for Transactive Multi-energy Microgrids
*K, Zhang, Troitzsch, S., Han, X*
International journal of electrical power and energy systems, Dec 2022

- Transition towards affordable electricity: Tools and methods
*S. Troitzsch, S. Hanif, T. Massier, K. Zhang, B. A. Bhatti, A. Ahmed and M. J. Alam.*
MDPI, E. Constable, Ed., Jun. 2022, vol. 7, ch. 2

## SKILLS & PROFICIENCY

**Python**

**Matlab**

**C++/C**

**Labview**

**SQL**