王者

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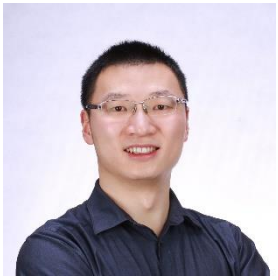

个人简介

王者，香港科技大学助理教授，**2021 海外优青**，**2023 港澳优青**，曾任劳伦斯伯克利国家实验室科学家。清华大学本科（双学位，均排名第一），剑桥大学硕士，清华大学博士（导师：朱颖心教授、林波荣教授），美国加州伯克利大学博士后；北京市优秀毕业生（2011，2017）；清华大学首批苏世民学者（2016）、紫荆学者（2017），受邀以**中方唯一青年学者代表**身份在刘延东副总理、克里国务卿主持的第七届中美人文交流高层对话（2016）上发言，曾被纽约时报（New York Times）报道（2016 年 1 月 11 日）。

王者的主要研究方向是未来建筑节能低碳、智慧运维、智能建造技术。面向我国新时期城镇化进程中的节能低碳、智能健康需求，围绕智能建筑的“人员--环境--计算”三要素开展基础原理和创新技术研究，在(1)人员与建筑环境交互模式、交互数据采集与预测新模型；(2)空间环境状态感知与大数据分析；(3)能源与环境系统智能控制优化算法等三方面取得系列创新成果。2021 年起，连续四年入选斯坦福大学和爱斯维尔联合发布的“全球前 2%顶尖科学家”榜单。王者现任 SCI 期刊 Advances in Applied Energy, Energy and Buildings, Building Simulation 编委；曾获 **2019 国家科技进步二等奖**，**2018 北京市科学技术一等奖**，2020 华夏建设科学技术一等奖；获香港机电署举办的 2022 国际建筑机电人工智能挑战赛第一名，NeurIPS CityLearn Challenge 2023 第二名。

工作经历

2021.11 至今 **香港科技大学，助理教授，智能建筑与建造实验室主任**

- PI，“建筑群-电动汽车-电网”互动的柔性潜力挖掘及调控技术（**200 万人民币**，2023 年度国家重点研发计划“城镇可持续发展关键技术与装备”重点专项），2024-2027
- PI, 绿色智慧建筑热环境（**200 万人民币**，国家自然科学基金委优秀青年基金（港澳），52322813），2024-2026
- PI, 基于动态热舒适的电动汽车座舱热环境管理与多目标优化研究（**30 万人民币**，国家自然科学基金委青年基金，52306028），2024-2026
- PI, Semantic AI empowered fault detection and control optimization for HVAC system of large-scale commercial buildings (**90 万港币**, the Innovation and Technology Fund by ITC, PRP-061-23FX), 2025-2028
- PI，Towards a human-centric smart cabin: System design integrating thermal comfort and air quality (**50 万港币**，HKUST – HKUST(GZ) 20 for 20 Cross-campus Collaborative Research Scheme，C006)，2024-2026
- PI, 基于无人机、机器视觉和多源数据融合的建筑结构探伤（**100 万人民币**，深圳瑞捷工程咨询股份有限公司研发课题），2024-2025
- PI, 多联机系统需求响应算法研究（**60 万人民币**，美的研发课题），2024
- PC，Toward 2060 Carbon Neutrality: Life-cycle Planning and Design of Photovoltaic Integrated Green Roof (PVIGR) Systems for Hong Kong and the Greater Bay Area (**346 万港币**, 香港研究资助局合作研究项目，C6003-22Y)，2023-2026
- PI，Model Predictive Control in Hong Kong’s Residential Buildings for Energy Efficiency and Load Flexibility (**84 万港币**, 香港研究资助局杰出青年学者计划，26209323)，2023-2026
- PI，公共建筑空调系统能效诊断与优化控制研究（**80 万人民币**，深圳市科委可持续发展科技专项 KCXST20221021111403009)，2023-2026
- PI，An AI-assisted solution for low-cost high-resolution urban scale environmental simulation (**36 万港币**, Fei Chi En Education and Research Fund)，2023-2025
- PI，建筑能源系统模拟与优化研究（**30 万人民币**，瑞安绿色可持续发展研究基金)，2023-2025

- PI，室内消毒与环境控制智能机器人（**72 万人民币**，佛山市政府课题 SHCIRI-FSNH-2203），2022-2024
- PI，电力需求响应软件架构研究（**60 万人民币**，美的研发课题），2022-2023
- PI，超大型数据中心制冷系统智能化节能方案研究（**30 万人民币**，2022 腾讯基础平台技术犀牛鸟专项研究计划），2022-2023

2018.07-2021.10 **美国劳伦斯伯克利国家实验室，项目科学家**

- co-PI，Reinforcement Learning for Building Control (**0.2M USD**，美国 LBNL 课题: BU21-036)
- Integrating Sensor Data with Physics-Based Models (**1.5M USD**，美国能源部课题: EE-5B37579)
- Hierarchical Occupancy Responsive MPC (**3.0M USD**，美国能源部课题: EE-5B24502)

2017.10-2018.06 **加州伯克利大学，博士后研究员**

- Personalized Wearable Comfort Devices (**0.5M USD**，美国 NSF 课题)

2016.12-2018.06 **世界银行，能源咨询专家**

- 世界银行&住建部：中国城市建筑节能和可再生能源应用项目，咨询专家

教育经历

2011.08-2017.07 **清华大学，建筑技术，博士**

- 哈佛大学访问学者，2015
- 获得：国家奖学金（2012），清华大学综合优秀奖学金（2012, 2015），波音奖学金（2015），北京建筑设计院优秀学生奖学金（2016），北京市优秀毕业生（2017），建筑学院优秀博士论文（2017）
- 共青团清华大学建筑学院委员会书记，2011-2013

2016.08-2017.07 **清华大学苏世民书院，公共政策，硕士**

- 受邀在 2016 年第七轮中美人文交流高层磋商全体会议（由中国副总理刘延东和美国国务卿克里主持）上发言，唯一中国青年学者代表
- 学生自治委员会成员（110 名学生中选举产生 12 名）

2013.10-2014.09 **剑桥大学，能源技术，硕士**

- 获得：Wing Yip 奖学金（每年 3 人）

2008.09-2011.07 **清华大学，经济学，学士**

- 平均绩点 92.8/100，排名 **1** / 126

2007.09-2011.07 **清华大学，土木工程，学士**

- 平均绩点 91.3/100，排名 **1** / 29
- 获得：国家奖学金（2009, 2010），波音奖学金（2011），北京市优秀毕业生（2011），清华大学优秀毕业生（2011），优秀学位论文（2011）
- 清华大学学生网络电视台台长，2010-2011

开源软件

MPCPy	Python-based open-source platform for model predictive control in buildings https://github.com/lbl-srg/MPCPy
Modelica Buildings Library	Dynamic simulation models for building energy and control systems https://github.com/lbl-srg/modelica-buildings

学术服务

期刊编委	*Energy and Buildings,* **Section Editor** *in Intelligent Building and Smart Control*
	Building Simulation, **Subject Editor** in *Building Control*
	Advances in Applied Energy, **Assistant Editor**
基金评委	*Frontier Competitive Research Program*, Singapore, 2024
	MTR Research Funding Scheme, HK, 2023

	The Dunhill Medical Trust, UK, 2020
会议组织	*Asian University Alliance Academic Conference on smart building*, **Conference Chair**, 2024 *Jiangsu-Hong Kong-Macau University Alliance Seminar on smart city and green building*, **Conference Chair**, 2023 *International Workshop on Reinforcement Learning for Energy Management in Buildings & Cities (RLEM)*, https://rlem-workshop.net/, **Member of Technical Program Committee**, 2020, 2021, 2023 The 13th *International Symposium on Heating, Ventilation and Air-conditioning (ISHVAC)*, http://ishvac2023.org/, **Member of Scientific Committee**, 2023
期刊审稿人	*Nature Energy, Applied Energy, Energy, Building and Environment, Energy and Building, Journal of Building Engineering, Building Simulation, Environmental Science and Pollution Research, Science and Technology for the Built Environment, SoftwareX, Journal of Building Performance Simulation, Applied Thermal Engineering, Advanced Engineering Informatics, Frontiers in Built Environment, International Journal of Biometeorology, Journal of Asian Architecture and Building Engineering, Journal of the Taiwan Institute of Chemical Engineer, Sustainable Cities and Society, Engineering*

获奖

1. 《绿色公共建筑环境与节能设计关键技术研究与应用》，2019 国家科学技术进步二等奖，证书号：2019-J-22101-2-01-R09
2. 2022 国际建筑机电人工智能挑战赛一等奖，香港机电署，学生第一作者，本人通讯作者（奖金 20 万港币）
3. 2023 NeurIPS CityLearn Challenge, control track, 学生第一作者，本人通讯作者
4. 《绿色公共建筑环境与节能设计关键技术研究与应用》，2018 北京市科学技术一等奖
5. 《公共建筑室内环境智能监控和节能关键技术研究》，2020 华夏建设科学技术一等奖

人才称号

1. 港澳优青，2023
2. 海外优青，2021
3. 乔治布什总统基金会 Fellow，2021-2024
4. 清华大学紫荆学者，2017
5. 清华大学苏世民学者，2016

专利

1. **王者**，一种能响应分时电价和需求响应信号的智能温控器和智能温控器的控制方法，中国专利申请号：202210667572.X，初审合格
2. **王者**，张世鸿，陈柳涛，吴至复，李磊，王朝亮，刘炜，城市尺度建筑能耗模拟方法、系统、存储介质和产品，中国专利申请号：202410909228.6，初审合格
3. **王者**，李斯琪，李书浩，冷机运行序列寻优方法、系统、存储介质和产品，中国专利申请号：202410909230.3，初审合格
4. **王者**，周期，郑烨，实时全局污染物浓度移动监测的路径规划方法和系统，中国专利申请号：202410909229.0，初审合格
5. 林波荣、赵海湉、**王者**，一种用于洗碗机的热回收装置，中国专利号: ZL 201320328067.9

学术文章

谷歌学术引用: 6473; h-index: 45; i10-index: 74; ESI 高被引论文: 5

(#: 共同第一作者; *: 通讯作者)

First Author

1. **Wang, Z.*** and He, Y., 2023. AlphaHydrogen: A virtual platform for simulating and evaluating station-based regional hydrogen-electricity networks with distributed renewables, buildings, and fuel-cell vehicles. Energy Conversion and Management, 280, p.116802.
2. **Wang, Z.***, 2022. How frequent should we measure the indoor thermal environment. Building and Environment, 222, p.109464.
3. **Wang, Z.**, Chen, B., Li, H. and Hong, T., 2021. AlphaBuilding ResCommunity: A multi-agent virtual testbed for community-level load coordination. Advances in Applied Energy, 4, p.100061.
4. **Wang, Z.**, Hong, T. and Li, H., 2021. Informing the planning of rotating power outages in heat waves through data analytics of connected smart thermostats for residential buildings. Environmental Research Letters, 16(7), p.074003.
5. **Wang, Z.**, Hong, T., Li, H. and Piette, M.A., 2021. Predicting city-scale daily electricity consumption using data-driven models. Advances in Applied Energy, 2, p.100025.
6. **Wang, Z.** and Hong, T., 2020. Reinforcement Learning for Building Controls: The opportunities and challenges. Applied Energy, 269, p.115036. (highly cited paper)
7. **Wang, Z.**, Hong, T. and Piette, M.A., 2020. Building thermal load prediction through shallow machine learning and deep learning. Applied Energy, 263, p.114683. (highly cited paper)
8. **Wang, Z.** and Hong, T., 2020. Learning occupants' indoor comfort temperature through a Bayesian inference approach for office buildings in United States. Renewable and Sustainable Energy Reviews, 119, p.109593.
9. **Wang, Z.** and Hong, T., 2020. Generating realistic building electrical load profiles through the Generative Adversarial Network (GAN). Energy and Buildings, p.110299.
10. **Wang, Z.**, Hong, T., Piette, M.A. and Pritoni, M. 2019, Inferring occupant counts from Wi-Fi data in buildings through machine learning, Building and Environment, 158, pp. 281-294.
11. **Wang, Z.**, Parkinson, T., Li, P., Lin, B. and Hong, T., 2019. The Squeaky wheel: Machine learning for anomaly detection in subjective thermal comfort votes. Building and Environment, 151, pp.219-227.
12. **Wang, Z.**, Zhang, H., He, Y., Luo, M., Li, Z., Hong, T. and Lin, B., 2020. Revisiting individual and group differences in thermal comfort based on ASHRAE database. Energy and Buildings, 219, p.110017.
13. **Wang, Z.**, Wang, J., He, Y., Liu, Y., Lin, B. and Hong, T., 2020. Dimension analysis of subjective thermal comfort metrics based on ASHRAE Global Thermal Comfort Database using machine learning. Journal of Building Engineering, 29, p.101120.
14. **Wang, Z.**, Hong, T. and Piette, M.A., 2019. Predicting plug loads with occupant count data through a deep learning approach. Energy, 181, pp.29-42.
15. **Wang, Z.**, Warren, K., Luo, M., He, X., Zhang, H., Arens, E., Chen, W., He, Y., Hu, Y., Jin, L. and Liu, S., 2019. Evaluating the comfort of thermally dynamic wearable devices. Building and Environment, p.106443.
16. **Wang, Z.**, Hong, T. and Piette, M.A., 2019. Data fusion in predicting internal heat gains for office buildings through a deep learning approach. Applied Energy, 240, pp.386-398.
17. **Wang, Z.**, Hong, T. and Jia, R., 2018. Buildings. Occupants: a Modelica package for modelling occupant behaviour in buildings. Journal of Building Performance Simulation, pp.1-12.
18. **Wang, Z.**, Luo, M., Geng, Y., Lin, B. and Zhu, Y., 2018. A model to compare convective and radiant heating systems for intermittent space heating. Applied Energy, 215, pp.211-226.
19. **Wang, Z.**, de Dear, R., Luo, M., Lin, B., He, Y., Ghahramani, A. and Zhu, Y., 2018. Individual difference in thermal comfort: A literature review. Building and Environment, 138, pp. 181-193 (highly cited paper)
20. **Wang, Z.**, Zhao, Z., Lin, B., Zhu, Y. and Ouyang, Q., 2015. Residential heating energy consumption modeling through a bottom-up approach for China's Hot Summer–Cold Winter climatic region. Energy and Buildings, 109, pp.65-74.
21. **Wang, Z.**, Zhao, H., Lin, B., Zhu, Y., Ouyang, Q. and Yu, J., 2015. Investigation of indoor environment quality of Chinese large-hub airport terminal buildings through longitudinal field measurement and subjective survey. Building and Environment, 94, pp.593-605.

22. **Wang, Z.**, de Dear, R., Lin, B., Zhu, Y. and Ouyang, Q., 2015. Rational selection of heating temperature set points for China's hot summer–Cold winter climatic region. Building and Environment, 93, pp.63-70.
23. **Wang, Z.**, Lin, B. and Zhu, Y., 2015. Modeling and measurement study on an intermittent heating system of a residence in Cambridgeshire. Building and Environment, 92, pp.380-386.

Co-first Author

24. Liu, S.*,#, **Wang, Z.***,#, Schiavon, S., He, Y., Luo, M., Zhang, H. and Arens, E., 2020. Predicted percentage dissatisfied with vertical temperature gradient. Energy and Buildings, p.110085.
25. Wang, J.#, **Wang, Z.**#, Zhou, D. and Sun, K., 2019. Key issues and novel optimization approaches of industrial waste heat recovery in district heating systems. Energy, p.116005.
26. Wang, J.#, **Wang, Z. ***,#, de Dear, R., Luo, M., Ghahramani, A. and Lin, B., 2018. The uncertainty of subjective thermal comfort measurement. Energy and Buildings, 181, pp.38-49.
27. Liu, Y.#, **Wang, Z.**#, Lin, B., Hong, J. and Zhu, Y., 2018. Occupant satisfaction in Three-Star-certified office buildings based on comparative study using LEED and BREEAM. Building and Environment, 132, pp.1-10.
28. Touzani, S.#, Prakash, A.K.#, **Wang, Z.**#, Agarwal, S., Pritoni, M., Kiran, M., Brown, R. and Granderson, J., 2021. Controlling distributed energy resources via deep reinforcement learning for load flexibility and energy efficiency. Applied Energy, 304, p.117733.

Corresponding Author

29. Wu, S., Yang, P., Chen, G. and **Wang, Z.***, 2025. Evaluating seasonal chiller performance using operational data. Applied Energy, 377, p.124377.
30. Li, M., **Wang, Z.***, Chang, H., Wang, Z. and Guo, J., 2024. A novel multi-objective generative design approach for sustainable building using multi-task learning (ANN) integration. Applied Energy, 376, p.124220.
31. Zheng, W., Wang, D. and **Wang, Z.***, 2024. Economic model predictive control for building HVAC system: A comparative analysis of model-based and data-driven approaches using the BOPTEST Framework. Applied Energy, 374, p.123969.
32. Wu, Z., **Wang, Z.***, Cheng, J.C. and Kwok, H.H., 2024. A knowledge-informed optimization framework for performance-based generative design of sustainable buildings. Applied Energy, 367, p.123318.
33. Wang, D., Zheng, W., **Wang, Z.***, Wu, Z., Shen, B. and Tian, S., 2024. Quantifying the potential of load flexibility for building HVAC system using model predictive control strategy. Energy and Buildings, p.114819.
34. Mohebi, P., Zheng, W. and **Wang, Z.***, 2024. Comparing different parameter identification techniques for optimal control of building energy systems. Energy and Buildings, 319, p.114563.
35. Pan, J., Duan, Z., Duan, J. and **Wang, Z.***, 2024. LUIE: Learnable physical model-guided underwater image enhancement with bi-directional unsupervised domain adaptation. Neurocomputing, p.128286.
36. Zhao, L., Zhou, Q. and **Wang, Z.***, 2024. A systematic review on modelling the thermal environment of vehicle cabins. Applied Thermal Engineering, p.124142.
37. Zhao, L., Zhou, Q., Li, M. and **Wang, Z.***, 2024. Evaluating different CFD surrogate modelling approaches for fast and accurate indoor environment simulation. Journal of Building Engineering, 95, p.110221.
38. Li, M., **Wang, Z.***, Fierro, G., Man, C.H.C., So, P.M.P. and Leung, K.F.C., 2024. Developing an automatic integration approach to generate Brick model from imperfect Building Information Modelling. Journal of Building Engineering, p.110697.
39. Wang, D., Zheng, W., Li, S., Li, D., Li, S., Li, B. and **Wang, Z.***, 2024. Field demonstration of priority stack-based controls in an office building for demand response. Journal of Building Engineering, p.109715.
40. Li, L., Ju, Y. and **Wang, Z.***, 2024. Quantifying the impact of building load forecasts on optimizing energy storage systems. Energy and Buildings, 307, p.113913.
41. Wang, D., Chen, Y., Wang, W., Gao, C. and **Wang, Z.***, 2023. Field test of Model Predictive Control in residential buildings for utility cost savings. Energy and Buildings, 288, p.113026.
42. Wang, D., Li, M., Guo, M., Shi, Q., Zheng, C., Li, D., Li, S. and **Wang, Z.***, 2023. Modelling Variable Refrigerant Flow System for Control Purpose. Energy and Buildings, p.113163.
43. Zhou, Q., Dong, P., Li, M. and **Wang, Z.***, 2023. Analyzing the interactions between photovoltaic system and its ambient environment using CFD techniques: A review. Energy and Buildings, p.113394.

44. Ju, Y., **Wang, Z.***, Ju, X., Cao, B., Chen, C. and Lin, B., 2023. Understanding occupancy patterns of university libraries in the post-pandemic era. Energy and Buildings, 291, p.113138.
45. Wu, Z., Cheng, J.C., **Wang, Z.*** and Kwok, H.H., 2023. An ontology-based framework for automatic building energy modeling with thermal zoning. Energy and Buildings, p.113267.
46. Zhong, H., Guo, M., Wang, Y. and **Wang, Z.***, 2023. Quantify the magnitude and energy impact of overcooling in a sub-tropical campus building. Building and Environment, p.110033.
47. Wang, D., Zheng, W., **Wang, Z.***, Wang, Y., Pang, X. and Wang, W., 2023. Comparison of reinforcement learning and model predictive control for building energy system optimization. Applied Thermal Engineering, 228, p.120430.
48. Zhou, Q., Zhong, H., Li, L. and **Wang, Z.***, 2023, February. AlphaMobileSensing: A virtual testbed for mobile environmental monitoring. In Building Simulation (pp. 1-14). Beijing: Tsinghua University Press.
49. Wang, Y., Wang, X., Zheng, L., Gao, X., **Wang, Z.***, You, S., Zhang, H. and Wei, S., 2023. Thermo-hydraulic coupled analysis of long-distance district heating systems based on a fully-dynamic model. Applied Thermal Engineering, 222, p.119912.
50. Luo, M., **Wang, Z.***, Ke, K., Cao, B., Zhai, Y. and Zhou, X., 2018. Human metabolic rate and thermal comfort in buildings: The problem and challenge. Building and Environment, 131, pp. 44-52

Second author

51. Jung, W., **Wang, Z.**, Hong, T. and Jazizadeh, F., 2023. Smart thermostat data-driven US residential occupancy schedules and development of a US residential occupancy schedule simulator. Building and Environment, p.110628.
52. Blum, D., **Wang, Z.**, Weyandt, C., Kim, D., Wetter, M., Hong, T. and Piette, M.A., 2022. Field demonstration and implementation analysis of model predictive control in an office HVAC system. Applied Energy, 318, p.119104.
53. Kim, D., **Wang, Z.**, Brugger, J., Blum, D., Wetter, M., Hong, T. and Piette, M.A., 2022. Site demonstration and performance evaluation of MPC for a large chiller plant with TES for renewable energy integration and grid decarbonization. Applied Energy, 321, p.119343.
54. Luo, N., **Wang, Z.**, Blum, D., Weyandt, C., Bourassa, N., Piette, M.A. and Hong, T., 2022. A three-year dataset supporting research on building energy management and occupancy analytics. Scientific Data, 9(1), p.156.
55. Wang, M., **Wang, Z.**, Geng, Y. and Lin, B., 2022. Interpreting the neural network model for HVAC system energy data mining. Building and Environment, 209, p.108449.
56. Pinto, G., **Wang, Z.**, Roy, A., Hong, T. and Capozzoli, A., 2022. Transfer learning for smart buildings: A critical review of algorithms, applications, and future perspectives. Advances in Applied Energy, p.100084.
57. Li, H., **Wang, Z.** and Hong, T., 2021. A synthetic building operation dataset. Scientific data, 8(1), pp.1-13.
58. Li, H., **Wang, Z.**, Hong, T. and Piette, M.A., 2021. Energy Flexibility of Residential Buildings: A Systematic Review of Characterization and Quantification Methods and Applications. Advances in Applied Energy, p.100054.
59. Li, H., **Wang, Z.**, Hong, T., Parker, A. and Neukomm, M., 2021. Characterizing patterns and variability of building electric load profiles in time and frequency domains. Applied Energy, 291, p.116721.
60. Li, H., **Wang, Z.** and Hong, T., 2021. Occupant-Centric key performance indicators to inform building design and operations. Journal of Building Performance Simulation, pp.1-29.
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