ZHOUPENG WANG

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EDUCATION

Tianjin University **Tianjin, China**
M.Eng. – Smart Building Sep. 2021 - Jun. 2024
• Overall GPA: 88.25/100 Rank: **1st/30**
• Course: Engineering Mathematics, Data Mining, Thermodynamics, Electricity/Electronics, Architecture Design, Building Information Modeling in Architecture, Building Thermal Environment and Intelligentization

Hefei University of Technology **Hefei, Anhui, China**
B.Eng. - Civil Engineering Sep. 2017 - Jun. 2021
• Overall GPA: 85.77/100 Rank: **4st/45**
• Courses: Advanced Mathematics, Linear Algebra, Probability Theory and Mathematical Atatistics, C Programming, MATLAB Programming, Structural Mechanics, University Physics, Material Mechanics, Theoretical Mechanics, Elasticity and Finite Element Method, Fluid Mechanics, Principle of Concrete Structure, Principles of Steel Structures

HONORS

• Third Prize in 2022 International Solar Building Design Competition 2023
• Second Prize in The 19th China Post-graduate Mathematical Contest in Modeling 2022
• Academic Scholarship, First-Class 2022
• Merit Student 2022
• Academic Scholarship, First-Class 2021
• Outstanding Graduate 2021

RESEARCH INTERESTS

AI applications in built environment; High-performance building envelopes; Building performance simulation; CFD in built environment; Machine Learning; Time series prediction

PUBLICATIONS

[1] Uncertainty quantification and sensitivity analysis of energy consumption in substation buildings at the planning stage
Guo, J., **Wang, Z.**, Li, M., and Jin, Y
Journal of Building Performance Simulation, 2022

[2] Optimized Design of Floor Plan and Components of Prefabricated Building with Energy-Cost Effect
Guo, J., Li, M., Jiang, Z., **Wang, Z.**, and Zhou, Y
Applied Sciences, 2022

[3] Energy Prediction and Optimization Based on Sequential Global Sensitivity Analysis: The Case Study of Courtyard-Style Dwellings in Cold Regions of China
Guo, J., Li, M., Jin, Y., Shi, C., and **Wang, Z.**
Buildings, 2022

[4] Predicting and extracting thermal behavior rules of hydronic thermal barrier with interpretable ensemble learning in the heating season
Guo, J., **Wang, Z.**, Jin, Y., Li, M., and Chen, Q.
Energy and Buildings, 2023 (Under Review, Co-first Author)

[5] Machine learning-assisted assessment and quantitative prediction of the effect of joint tolerances on thermal bridges in precast elements
Guo, J., **Wang, Z.**, Jin, Y., Zhao, W., Li, M., Feng, H., and Chen, Q.
Building and Environment, 2023 (Under Review)

PATENTS

[1] A hydronic Thermo-active building system thermal performance prediction and mechanism extraction method and device
Guo, J., **Wang, Z.**, Jin, Y. and Wang, J.
China National Intellectual Property Administration, 2023

RESEARCH EXPERIENCE

National Key R & D Program of China Sep. 2021 - Mar. 2023
Advisors: **Prof. Juanli Guo, Ting Zhou** (School of Architecture, Tianjin University)

- Design the overall route to energy efficiency in buildings.
- Participate in the design of demonstration projects (Application of building technology).
- Conduct building performance simulations based on Grasshopper (Ladgbug & Honeybee).

Tianjin Natural Science Foundation Sep. 2021 - Mar. 2022
Advisors: **Prof. Juanli Guo** (School of Architecture, Tianjin University)
- Field research.
- Conduct building performance simulations based on Grasshopper (Ladgbug & Honeybee).
- Implement multi-objective optimization based on Grasshopper (Octopus).
- Perform correlation analysis utilizing SPSS.

National Grid Corporation Science and Technology Project Dec. 2021 - Dec. 2023
Advisors: **Prof. Juanli Guo, Gang Liu** (School of Architecture, Tianjin University)
- Field research.
- Conduct building performance simulations based on Grasshopper (Ladgbug & Honeybee).
- Implement sensitivity analysis of critical design parameters for substation buildings based on R.
- Implement thermal performance simulation of hydronic thermal activated envelopes based on COMSOL.
- Implement thermal performance prediction and rule extraction for hydronic thermal activated envelopes based on machine learning and eXplainable AI (Python).
- Develop thermal performance prediction software for hydronic thermal activated envelopes based on Python.
- Analyze the impact of thermal bridges generated by joint tolerances in prefabricated buildings on the indoor environment based on COMSOL.
- Implement linear thermal transmittance sensitivity analysis and develop linear thermal transmittance prediction models based on machine learning (Python).
- Develop green design evaluation system for substation based on AHP and FCE (MATLAB).

Shenzhen Gangxia North Comprehensive Transportation Hub Physical Environment Study Dec. 2021 - Dec. 2022
Advisors: **Prof. Juanli Guo, Zhen Xu** (School of Architecture, Tianjin University)
- Field research. Test Physical Environment.
- Analyze the impact of the atrium on the indoor physical environment (Temperature, Humidity, Illumination).
- Conduct building performance simulations based on Grasshopper (Ladgbug & Honeybee) to compare with measured results.
- Propose design improvements based on measurements and simulation analysis results.

Shun'an Yuanda Ultra-low Energy Building Demonstration Sep. 2021 - Dec. 2023
Advisors: **Prof. Juanli Guo, Ting Zhou** (School of Architecture, Tianjin University)
- Field research.
- Participate in the design of demonstration project.
- Conduct building performance simulations based on Grasshopper (Ladgbug & Honeybee) and calculate project costs.

EXTRACURRICULAR ACTIVITIES & INTERESTS

- Member of the Student Union Sep. 2021 - Sep.2022
  - Engaged in interviews with outstanding students.
  - Engaged in volunteer activities.
- State Grid Shandong Electric Power Company, Intern Dec. 2022 - Jun.2023
  - Engaged in substation field studies.
  - Led the writing of research reports.
- China Railway Design Corporation, Intern Jul. 2022 - Sep.2022
  - Engaged in physical environment testing.
  - Led the writing of research reports.
- Longfor Group Holdings Limited Jun. 2021 - Sep.2021
  - Engaged in land site surveys.
  - Produce preliminary land judgment reports and conduct preliminary investment calculations.

SKILLS

Tools: Energy Plus, Rhino & Grasshopper (Ladgbug & Honeybee), Python, MATLAB, R, COMSOL Multiphysics, SketchUp, LATEX

Languages: Mandarin (Native), English

Interests: Programming, Mathematical Modeling, Calligraphy, Photography, NBA