Ruiqi Peng

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Education Background

Ph.D. in Water Resources and Hydropower Engineering 2026.9–Now
Wuhan University, School of Water Resources and Hydropower Engineering
Supervisor: Prof. Jiyun Song

B.Eng. in Water Resources and Hydropower Engineering(Carbon Neutrality Experimental Class) 2022.9–2026.6
Wuhan University, School of Water Resources and Hydropower Engineering
Supervisor: Prof. Jiyun Song
GPA: 3.78/4.0

Research Interests

– Urban water–heat–carbon coupling mechanisms and synergistic effects
– WRF-based high-resolution urban climate modeling and simulation
– Spatiotemporal evolution and attribution analysis of multi-element urban environmental variables

Manuscripts in Preparation

1. Peng R., Song J.*, et al. Synergistic effects of water, heat, and carbon on sustainable urban development: A multi-city analysis across the Yangtze River Economic Belt. (In preparation)

Research & Project Experience

1. Ph.D. Research: Urban Water–Heat–Carbon Coupling and WRF Simulation 2026–Now
Wuhan University, School of Water Resources and Hydropower Engineering
— Investigating the spatiotemporal coupling patterns of urban water, heat, and carbon fluxes and their synergistic impacts on sustainable urban development across the Yangtze River Economic Belt.
— Developing WRF-based urban climate simulations to characterize multi-element interactions and feedback mechanisms at the city scale.

2. Undergraduate Thesis: Spatiotemporal Evolution and Attribution of Urban Water–Heat–Carbon Elements in the Yangtze River Economic Belt 2025–2026
Wuhan University, School of Water Resources and Hydropower Engineering
— Analyzed nearly 20 years (2004–2024) of remote sensing and reanalysis data to map the spatiotemporal dynamics of urban water, heat, and carbon variables across major cities in the Yangtze River Economic Belt.
— Applied statistical attribution methods to disentangle natural climatic drivers from anthropogenic factors (urban expansion, land-use change, socioeconomic activities).
— Quantified coupling relationships among multi-element environmental variables to inform carbon-neutral urban planning strategies.

3. Urban Carbon Dioxide Measurement Experiment 2024–2025
Wuhan University, School of Water Resources and Hydropower Engineering
— Participated in urban CO_2 field measurement campaigns across multiple sites in Wuhan.
— Operated portable CO_2 monitoring instruments and performed data quality control.

Academic Activities

1. Academic Exchange Visit to The University of Hong Kong, accompanied by Prof. Jiyun Song 2025.11
2. Attended Seminar: "Human-Environment Interaction Research Based on Remote Sensing Spatiotemporal Big Data" by Prof. Yuyu Zhou, The University of Hong Kong 2023.01
3. Attended Seminar: "Heatwaves, Urban Warming and Health Impacts — Research Experience and Applications from Hong Kong" by Prof. Chao Ren, The University of Hong Kong 2025.12

Honours & Awards

1. National Encouragement Scholarship, Ministry of Education of China 2022–2023
2. Outstanding Student Scholarship (Third-Class), Wuhan University 2022–2023
3. Jucheng Self-improvement Scholarship, Wuhan University 2022–2023
4. National College Student Mathematical Modeling Competition, Hubei Province Third Prize 2024.09
5. Wuhan University ChengTu Innovation Design Competition, University-level Second Prize 2023.06

Skills

– Numerical Modeling: WRF and WRF-UCM (urban canopy schemes); NetCDF data processing((In preparation)
– Geospatial Analysis: ArcGIS, remote sensing data acquisition and processing, spatiotemporal statistical analysis
– Scientific Programming: Python , MATLAB, C, C++
– Software & Tools: AutoCAD, SPSS, Origin, MS Office, Overleaf
– Languages: English (CET-4: 494, CET-6: 443), Chinese (Native)