Junjie Yu

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Education

2023–26*	**Ph.D.**, Environmental Sciences, The University of Manchester
2020-23	**M.S.**, Environmental Engineering, Research Center for Eco-Environmental Sciences
2016-20	**B.Eng.**, Environmental Engineering, China University of Mining and Technology-Beijing

Awards & Honors

2025.06	The University of Manchester Open Research Award 2025
2024.11	Travel funding to attend Transforming Urban Living with AI and Digital Twins
2023.09	Significant Contributor in City Brain Open Research - Open Data Computing Workshop on Urban Climate
2022.06	National Scholarship for Graduate Students (the highest honor for postgraduates in China, 3%)
2020.06	Excellent Graduates in Beijing (5%)
2019.06	Special-Class Award in Beijing Energy and Water Conservation Low Carbon Emission Reduction Social Practice and Technology Competition
2018.12	Second Prize in Beijing Chemistry Experiment Competition
2017.11	First Prize in National University Student Mathematics Competition

Projects

2025.09	Physics-Informed Deep Learning for Local Climate Zones (LCZ)-Based Urban Climate, funded by NVIDIA, Inc. (2 NVIDIA RTX PRO 6000 Blackwell GPUs), **Co-I**
2025.07	Cloud-based Platform for Democratizing Urban Climate Modeling, funded by Amazon Web Services, Inc. ($5000 cloud computing credit), **Co-I**
2025.04	Co-developed the research proposal of the UKRI Impact Acceleration Account Scheme Funding (£10000), funded by UKRI, **Research & Innovation Research Assistant**
2023.10	Unpacking the Dual Impacts of Dynamic Urban Land Change and Internal Climate Variability on Local Urban Climate, funded by UK ARCHER2, **Co-I**

*Expected.

Research & Industry

Urban Climate Simulation Cloud-based Platform (supported by Amazon Web Services, Inc.)

- Developed full-stack application for running urban climate simulations driven by ERA5 data, using **FastAPI** (backend) and **HTML/JavaScript** (frontend UI).
- Designed and implemented cloud deployment on **AWS ECS/Fargate**, with containerized services, **Application Load Balancer (ALB)**, and secure networking configuration.
- Integrated **S3**-based data storage for model input/output (e.g., **Zarr**, NetCDF results), ensuring scalable and efficient data access.
- Configured domain, CNAME, Target Groups, and health checks, optimizing system performance and troubleshooting network bottlenecks.

Publications

Google Scholar

† → Equal contribution

Journal Articles

J1. Xia, J., Ling, F., Li, Z., **Yu, Junjie**, Zhang, H., Topping, D. O., Bai, L. & Zheng, Z. Learning Urban Climate Dynamics via Physics-Guided Urban Surface–Atmosphere Interactions. *Proceedings of the Thirty-Ninth Annual Conference on Neural Information Processing Systems (NeurIPS 2025, Main Conference)* (2025).

J2. **Yu, Junjie**, Li, W., Tang, G., Topping, D. O. & Zheng, Z. Assessing ERA5-Land Air Temperature for Urban Climate Studies in the United Kingdom. *In preparation* (2025).

J3. **Yu, Junjie**, Li, W., Topping, D. O. & Zheng, Z. Diffusion-Based Downscaling for Future Extreme Precipitation Health Risk Estimation. *In preparation* (2025).

J4. **Yu, Junjie**, Oleson, K. W., Topping, D. O. & Zheng, Z. Modeling a Rainwater Harvesting and Roof Sprinkling System to Adapt to Urban Extreme Heat. *In preparation* (2025).

J5. **Yu, Junjie**, Schreck, J. S., Gagne, D. J., Oleson, K. W., Li, J., Liang, Y., Liao, Q., Sun, M., Topping, D. O. & Zheng, Z. Reinforcement Learning (RL) Meets Urban Climate Modeling: Investigating the Efficacy and Impacts of RL-Based HVAC Control. *ArXiv Preprint* (2025).

J6. **Yu, Junjie**, Sun, Y., Lindley, S., Jay, C., Topping, D. O., Oleson, K. W. & Zheng, Z. Integration and execution of Community Land Model Urban (CLMU) in a containerized environment. *Environmental Modelling Software* **188,** 106391 (2025).

J7. **Yu, Junjie**, Zheng, Z., Lindley, S., Zhao, L., Wang, C., Wu, Q., Li, L., Topping, D., Schreck, J. S., Gagne, D. J. & Oleson, K. Leveraging Automated Machine Learning (AutoML) for Urban Climate Emulation. *EarthArXiv Preprint* (2025).

J8. Sun, H., Jiao, R., **Yu, Junjie** & Wang, D. Combined effects of particle size and humic acid corona on the aggregation kinetics of nanoplastics in aquatic environments. *Science of the Total Environment* **901** (2023).

J9. Sun, H., Jiao, R., Yang, Q., **Yu, Junjie** & Wang, D. Aggregation and settling characteristics of particulate matter and DOM in a southern China reservoir: Influence of hydraulic conditions and dosing methods. *Process Safety and Environmental Protection* **166,** 500–511 (2022).

J10. Wang, Z., Xu, H., **Yu, Junjie**, Zhao, C. & Wang, D. Effect of particulate matter on coagulation process and ultrafiltration membrane contamination. *Zhongguo Huanjing Kexue/China Environmental Science* **42,** 4621–4630 (2022).

J11. **Yu, Junjie**, Jiao, R., Sun, H., Xu, H., He, Y. & Wang, D. Removal of microorganic pollutants in aquatic environment: The utilization of Fe(VI). *Journal of Environmental Management* **316** (2022).

J12. **Yu, Junjie**, Xu, H., Sun, H., Jin, Z.-Y. & Wang, D.-S. Mechanism on the effects of floc aging and pH adjustment on reflux feed water and coagulation. *Zhongguo Huanjing Kexue/China Environmental Science* **42,** 4612–4620 (2022).

J13. **Yu, Junjie**, Xu, H., Wang, D., Sun, H., Jiao, R., Liu, Y., Jin, Z. & Zhang, S. Variations in NOM during floc aging: Effect of typical Al-based coagulants and different particle sizes. *Water Research* **218** (2022).

J14. **Yu, Junjie**, Xu, H., Yang, X., Sun, H., Jin, Z. & Wang, D. Floc formation and growth during coagulation removing humic acid: Effect of stirring condition. *Separation and Purification Technology* **302** (2022).

J15. Li, M., Xu, H., Wang, D., Wang, X. & **Yu, Junjie**. Comparison of the effect of AlCl3 and Al13 on sludge conditioning in water supply plant. *Chinese Journal of Environmental Engineering* **15,** 1075–1082 (2021).

Tools & Software

Data sciences

Google Colab: AutoML for observational weather data.

obswx: A Python package for accessing observational meteorological data (PyPi | GitHub).

Climate modeling

pyclmuapp: Integration and Execution of Community Land Model Urban (CLMU) in a Containerized Environment (PyPi | GitHub).

CLMU-App: Enabling Operating System Independent Urban Climate Simulations (GitHub).

Presentations

Talks

T1. **Junjie Yu**. *Democratizing Urban Climate Modeling with an Open-Source Framework*. UoM-CUHK joint workshop: Earth system modelling for environmental/climate risk assessments and adaptations. Oct. 2025.

T2. **Junjie Yu**. *Integration and Execution of Community Land Model Urban (CLMU) in a Containerized Environment* 12th International Conference on Urban Climate. July 2025.

T3. **Junjie Yu**. *Integration and Execution of Community Land Model Urban (CLMU) in a Containerized Environment* 30th Annual CESM Workshop. June 2025.

T4. **Junjie Yu**. *Integration and Execution of Community Land Model Urban (CLMU) in a Containerized Environment* Centre for Atmospheric Science seminar. Jan. 2025.

T5. **Junjie Yu**. *Pyclmuapp: A Python Package for Quick Use of Community Land Model Urban.* NERC's Digital Gathering 2024. Aug. 2024.

T6. **Junjie Yu**. *Towards urban climate digital twins: a containerized urban climate model. (Travel funded).* Transforming Urban Living with AI and Digital Twins. Nov. 2024.

T7. **Junjie Yu**. *Reinforcement Learning for Earth and Environmental Sciences.* The Group Meeting of Machine Integration and Learning for Earth Systems of Computational Information Systems Laboratory (CISL) of The National Center for Atmospheric Research (NCAR). Nov. 2023.

Posters

P1. Zhonghua Zheng **Junjie Yu**, K. O. & Zhao, L. *Projections of Global Urban Heat Waves Empowered by Machine Learning.* 4th UK National Climate Impacts Meeting. Aug. 2024.

P2. Kuang Wang **Junjie Yu**, Z. L. & Zheng, Z. *Leverage a Cloud-based Big Data Processing Platform for Climate Extremes Research.* AGU Fall Meeting 2023 Abstract. Dec. 2023.

Teaching

The University of Manchester

2025.08	Lecturer, **Urban climate modeling and automated machine learning for weather data modeling** for the exchange program of undergraduate students from the School of Earth Sciences, Zhejiang University, China and the College of Earth Sciences, Jilin University, China
2025.01	Graduate Teaching Assistant, **EART11200 The Natural Scientists Toolkit**
2025.01	Graduate Teaching Assistant, **EART60702 Earth and Environmental Data Science 2023-24 2nd Semester**
2024.08	Lecturer, **Observational weather data processing and automated machine learning for weather data modeling** for the exchange program of undergraduate students from the School of Earth Sciences, Zhejiang University, China

Academic Advising

Postgraduates

2025	Mengqi Hu, The University of Manchester (Data Science, School of Social Science, Faculty of Humanities)

Undergraduates

2025	Xinpeng Xu, Zhejiang University (Atmospheric Sciences)
2023	Kuang Wang, Zhejiang University (Biosystems Engineering) -> PhD (Computer Science) at The Chinese University of Hong Kong, Shenzhen

Academic Services

Event Organizations

2025.05	Coordinator of Urban Climate Resilience Workshop, at The University of Manchester, founded by UKRI IAA Starter Fund & UoM-CUHK Joint Research Fund.
2025-2026	Coordinator of Seminar of Centre for Atmospheric Science 2025, at The University of Manchester.

Event Supports

2025.03	Assistance of the exchange program of undergraduate students from the School of Environmental Sciences and Engineering, Peking University, China
2024.02	Assistance of the exchange program of undergraduate students from the School of Environmental Sciences and Engineering, Peking University, China

Training

2025	2025 Winter WRF Tutorial (provided by Mesoscale and Microscale Meteorology Laboratory National Center for Atmospheric Research), Online
2025	AWS Workshop on Cloud Research & Teaching Tools, The University of Manchester, Manchester, UK
2023	Training of SQL and could computing, Yunqi Academy of Engineering, Hangzhou, China

Skills

Python (Machine Learning, Data analytics, Web-based application), **R** (DLNM for health attribution modeling), **Fortran** (Earth system model development), **Earth system modeling** (Community Earth system modeling), **SQL** (Web database and Cloud computing).

Last updated: October 27, 2025