

Zhen Qian (钱 振)

Technical University of Munich
TUM School of Engineering and Design
Lise-Meitner-Straße 9
85521 Ottobrunn, Germany

[Personal Homepage](#)
[Google Scholar](#)
[ResearchGate](#)
Email: zhen.qian@tum.de

RESEARCH PROFILE: *Interdisciplinary scientist in Earth Systems, with training in Climate Science, GIScience, and AI. Dedicated to leveraging spatiotemporal intelligence to advance the monitoring, modeling, prediction, and physical understanding of Earth system dynamics and climate impacts in the Anthropocene.*

EDUCATION

Technical University of Munich <i>Doctoral student in Earth System Modeling</i> <i>Supervisor: Prof. Dr. Niklas Boers</i>	03/2024 – Present Munich, Germany
Nanjing Normal University <i>M.Sc. in GIScience (Graduated with Highest Distinction)</i> <i>Supervisor: Prof. Dr. Min Chen</i>	09/2020 – 06/2023 Nanjing, China
Nantong University <i>B.Sc. in GIScience (Graduated with Highest Distinction)</i>	09/2016 – 06/2020 Nantong, China

RESEARCH EXPERIENCE

Potsdam Institute for Climate Impact Research <i>Guest Researcher in the Artificial Intelligence Working Group</i>	03/2024 – Present Potsdam, Germany
--	---------------------------------------

RESEARCH INTERESTS

Earth System Dynamics & Early Warning: Spatiotemporal nonlinear dynamics, tipping points, compound extreme events, and land-atmosphere feedbacks.

Climate Impacts in the Anthropocene: Vulnerability and resilience of natural ecosystems and urban infrastructure, climate change mitigation, and adaptation.

Earth System Spatiotemporal Intelligence: Physics-aware & data-driven modeling, deep learning (generative, geometric, and probabilistic), and uncertainty quantification.

SELECTED PUBLICATIONS

Publication Notes

- Over 20 peer-reviewed publications (10 as first author, including those in *Nat. Rev. Earth Environ.*, *Nat. Clim. Change*, *Nat. Geosci.*, *Nat. Commun.*)
- Citations: > 1500; h-index: 16; i10-index: 18 (Statistics by [Google Scholar](#))
- Note: “†” indicates equal contribution

Featured Research Articles

1. [Decadal sink-source shifts of forest aboveground carbon since 1988](#)
Qian, Z., Bathiany, S., Liu, T., Blaschke, LL., Teo, H. and Boers, N.
Nature Communications, 2026
2. [Worldwide rooftop photovoltaic electricity generation may mitigate global warming](#)
Zhang, Z.†, **Qian, Z.†**, Chen, M., et al.
Nature Climate Change, 15, 393–402, 2025
3. [Simultaneous extraction of diverse building information across large-scale urban landscapes using high-resolution satellite imagery](#)
Qian, Z., Chen, M., Sun, Z., Zhang, F., Xu, Q., Guo, J., Xie, Z. and Zhang, Z.
Sustainable Cities and Society, 106, 105393, 2024
4. [Vectorized dataset of roadside noise barriers in China using street view imagery](#)
Qian, Z., Chen, M., Yang, Y., et al.
Earth System Science Data, 14, 4057–4076, 2022
5. [Deep Roof Refiner: A detail-oriented deep learning network for refined delineation of roof structure lines using satellite imagery](#)
Qian, Z., Chen, M., Zhong, T., et al.
Int. J. of Applied Earth Observation and Geoinformation, 107, 102680, 2022

Featured Perspectives & Commentaries

1. [Collaboration between artificial intelligence and Earth science communities for mutual benefit](#)
Chen, M.†, **Qian, Z.†**, Boers, N., et al.
Nature Geoscience, 17, 949–952, 2024
2. [Iterative integration of deep learning in hybrid Earth surface system modeling](#)
Chen, M.†, **Qian, Z.†**, Boers, N., et al.
Nature Reviews Earth & Environment, 4, 568–581, 2023

Working Papers

1. [Generative deep learning improves reconstruction of global historical climate records](#) (Under Review)
Qian, Z., Liu, T., Bathiany, S., Yang, S., Hess, P., Bochow, N., Burmester, C., Gelbrecht, M., Groenke, B. and Boers, N.

SELECTED AWARDS & HONORS

Academic Awards

Top 10 Research Achievements of Chinese Geography	2024
Top 10 Sci-Tech Achievements of China Society of Territorial Economists	2023
Outstanding Master's Thesis of Jiangsu Province	2024
Outstanding Graduate of Jiangsu Province	2023
Outstanding Bachelor's Thesis of Jiangsu Province	2021
Outstanding Graduate of Jiangsu Province	2020

Fellowships & Scholarships

President's Scholarship for Postgraduates (Highest honor in university)	2023
National Scholarship for Postgraduates	2022
National Scholarship for Undergraduates	2018

RESEARCH GRANTS & PROJECTS

Provincial Research and Practice Innovation Program	2022-2023
<i>Role: PI / Title: Spatial intelligent analysis considering geographic priors</i>	
Provincial Research and Practice Innovation Program	2018-2019
<i>Role: PI / Title: Travel behavior detection based on artificial intelligence</i>	

ACADEMIC ACTIVITIES

Reviewer Services

IPCC AR7 WGI Chapter 6 FOD ECR; Nature Communications; Earth System Science Data; Journal of Geophysical Research: Atmospheres; Cities; Computers, Environment and Urban Systems; Geo-spatial Information Science; IEEE IGARSS 2025 & 2026; IEEE JSTARS; Int. J. of Applied Earth Observation and Geoinformation; Urban Climate

Invited Talks

Alfred Wegener Institute Research Unit Potsdam (<i>Potsdam, Germany</i>)	05/2026
<i>Title: Generative deep learning improves reconstruction of global historical climate records</i>	
TU Munich Earth Observation Colloquium (<i>Munich, Germany</i>)	12/2025
<i>Title: Decadal sink-source shifts of forest aboveground carbon since 1988</i>	
Nanjing Normal University OpenGMS Group (<i>Nanjing, China</i>)	10/2025
<i>Title: Reconstructing Earth system dynamics with uncertainty-aware deep learning</i>	

BEYOND RESEARCH

Languages

Mandarin (Native), English (Professional), German (Elementary)

Interests & Hobbies

Bouldering, hiking, strength training, and nutrition-focused culinary arts