

# Dr Qiming Zheng (Jimmy)

## Research Assistant Professor

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Links: [Google Scholar](#) / [Personal Website](#)

## RESEARCH INTERESTS

My research interests center on understanding the urban-climate-environment nexus. I am especially keen to use remote sensing, GIS and geospatial techniques, environment and climate models, and machine learning approaches to address cutting-edge issues on urban environmental/climatic changes and urban sustainability, and to deliver policy-relevant mitigation and adaption solutions. My current research focuses on the following themes:

- Remote sensing of urban environment;
- Global environmental and climate change;
- Land-based solution for climate change mitigation and sustainable development;
- Remote sensing image processing techniques and applications;

## APPOINTMENTS

**2024.07-**     **Assistant Professor** (Tenure-Track), Department of Geography and Resource Management, The Chinese University of Hong Kong

**2024.01-**     **Parttime Lecturer**, Department of Geography and Resource Management, The  
**2024.06**     Chinese University of Hong Kong

**2023.01-**     **Research Assistant Professor**, Department of Land Surveying and Geo-  
**2024.06**     Informatics, Hong Kong Polytechnic University (Lab director: Dr Qihao Weng)

**2023.01-**     **Lab Manager**, Jockey Club STEM Lab of Earth Observations & Research Centre  
**2023.10**     for Artificial Intelligence in Geomatics, Hong Kong Polytechnic University

**2020.08-**     **Postdoctoral Research Fellow**, Centre for Nature-based Climate Solutions,  
**2023.01**     National University of Singapore (Lab director: Dr Lian Pin Koh)

## EDUCATION

**2015-2020**   **PhD** in Remote Sensing and Geographic Information System, Zhejiang University

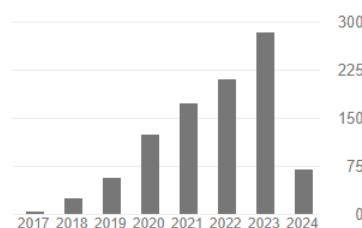
**2018-2019**   **Visiting PhD Student**, Indiana State University (Advisor: Dr Qihao Weng)

**2011-2015**   **BSc** in Environment and Resources Sciences, Zhejiang University

## PUBLICATIONS

I have published **35** scientific articles in high-profile journals, such as *Nature Communications*, *Remote Sensing of Environment*, *ISPRS Journal of Photogrammetry and Remote Sensing*, *Global Change Biology*, etc.

- Total journal publications: **32**  
(First/Corresponding author: **14**; Under review: 2)
- Total citations: **967**;
- H-index: **16**
- Book chapters: **2**; Comment/Letter: **1**




### Selected Publications

- [1] **Zheng Q**, Weng Q, Wang K. Characterizing urban changes of 30 global mega-cities using dense nighttime light time series stacks. *ISPRS Journal of Photogrammetry and Remote Sensing*. 2021. (Most popular paper in ISPRS Journal in the past 3 years)
- [2] **Zheng Q\***, Ha T, Prishchepov A, et al. The neglected role of abandoned cropland in supporting food security and climate change mitigation. *Nature Communications*. 2023.   
*Media*: [Eurekalert AAAS](#); [BNN Bloomberg](#); [Earth.com](#); [Phys.org](#); [Foodnavigator.com](#); etc.   
*Cited by*: [UN Convention to Combat Desertification: Synergy Report \(2023\)](#)
- [3] **Zheng Q**, Weng Q, Wang K. Developing a new cross-sensor calibration model for DMSP-OLS and Suomi-NPP VIIRS night-light imagery. *ISPRS Journal of Photogrammetry and Remote Sensing*. 2019.
- [4] **Zheng Q\***, Weng Q, Zhou Y, et al. Impact of temporal composite on nighttime light (NTL) data and its applications. *Remote Sensing of Environment*. 2022.
- [5] **Zheng Q**, Weng Q, Huang L, et al. A new source of multi-spectral high spatial resolution night-time light imagery—JL1-3B. *Remote Sensing of Environment*. 2018.

### Journal Articles (\*corresponding author; #supervised graduate students/RA)

- [1] Weng Q, Li Z, ..., **Zheng Q**, et al. How Will AI Transform Urban Observing, Sensing, Imaging, And Mapping? 2023. (Under review in *npj Urban Sustainability*).
- [2] Guo B, Hu, D, Liu, Y, **Zheng Q**, Atkinson P. A novel nighttime light downscaling index method for generating annual high-definition nighttime light product. (Under Review in *International Journal of Applied Earth Observation and Geo-information*)
- [3] Dong B#, **Zheng Q\***, et al. Integrating physical model-based features and spatial contextual information to estimate building height in complex urban areas. *International Journal of Applied Earth Observation and Geo-information*. 2023.
- [4] **Zheng Q**, Weng Q. The emerging opportunities to improve light pollution measurement. *Science*. 2023. (eLetter commentary; non-peer-reviewed).
- [6] **Zheng Q\***, Ha T#, Prishchepov A, et al. The neglected role of abandoned cropland in supporting food security and climate change mitigation. *Nature Communications*. 2023.   
*Media*: [Eurekalert AAAS](#); [BNN Bloomberg](#); [Earth.com](#); [Phys.org](#); [Foodnavigator.com](#); etc.   
*Cited by*: [UN Convention to Combat Desertification: Synergy Report \(2023\)](#)
- [5] **Zheng Q**, Seto KC, Zhou Y, You S#, Weng Q\*. Nighttime light remote sensing for urban applications: progress, challenges, and prospects. *ISPRS Journal of Photogrammetry and Remote Sensing*. 2023. [🔗 Highly Cited Paper](#)
- [6] **Zheng Q\***, Weng Q, Zhou Y, et al. Impact of temporal composite on nighttime light (NTL) data and its applications. *Remote Sensing of Environment*. 2022.
- [7] **Zheng Q\***, Kelly S, Koh LP, et al. Future land-use competition constrains natural climate solutions. *Science of the Total Environment*. 2022.

- [8] **Zheng Q\***, Teo HC, Koh LP. Artificial light at night advances spring phenology in the United States. [Remote Sensing](#). 2021  
([Issue cover story](#); TOP10 notable articles of the season; [Best cover award of 2021](#)).
- [9] **Zheng Q**, Weng Q, Wang K. Characterizing urban changes of 30 global mega-cities using dense nighttime light time series stacks. [ISPRS Journal of Photogrammetry and Remote Sensing](#). 2021.  
(Most popular paper in ISPRS Journal in the past 3 years)
- [10] **Zheng Q**, Weng Q, Wang K. Correcting the Pixel Blooming Effect (PiBE) of DMSP-OLS nighttime light imagery. [Remote Sensing of Environment](#). 2020.
- [11] **Zheng Q**, Weng Q, Wang K. Developing a new cross-sensor calibration model for DMSP-OLS and Suomi-NPP VIIRS night-light imageries. [ISPRS Journal of Photogrammetry and Remote Sensing](#). 2019.
- [12] **Zheng Q**, Weng Q, Huang L, et al. A new source of multi-spectral high spatial resolution night-time light imagery—JL1-3B. [Remote Sensing of Environment](#). 2018.
- [13] **Zheng Q**, Jiang R, Wang K, et al. Monitoring the trajectory of urban nighttime light hotspots using a Gaussian volume model. [International Journal of Applied Earth Observation and Geo-information](#). 2018.
- [14] **Zheng Q\***, Wang K. Analysis of the spatio-temporal dynamic of polycentric city using night-time light remote sensing imagery. [IGARSS 2018 - 2018 IEEE International Geoscience and Remote Sensing Symposium](#). 2018. (Conference proceeding)
- [15] **Zheng Q**, Zeng Y, Deng J, et al. “Ghost cities” identification using multi-source remote sensing datasets: A case study in Yangtze River Delta. [Applied Geography](#). 2017.
- [16] **Zheng Q**, Deng J, Jiang R, et al. Monitoring and assessing “ghost cities” in Northeast China from the view of nighttime light remote sensing data. [Habitat International](#). 2017.
- [17] Chen B, **Zheng Q**, et al. Geo-STO3Net: A deep neural network integrating geographical spatiotemporal information for surface ozone estimation. [IEEE Transactions on Geoscience and Remote Sensing](#). 2023.
- [18] Teo HC, Tan N, **Zheng Q**, et al. Uncertainties in deforestation emission baseline methodologies and implications for carbon markets. [Nature Communications](#). 2023.
- [19] Biyun Guo, Deyong Hu, **Zheng Q**. Potentiality of SDGSAT-1 glimmer imagery to investigate the spatial variability in nighttime-lights. [International Journal of Applied Earth Observation and Geo-information](#). 2023.  [Highly Cited Paper](#)
- [20] Teo HC, Koh LP, **Zheng Q**, et al. Large-scale reforestation can increase water yield and reduce drought risk for water-insecure regions in the Asia-Pacific. [Global Change Biology](#). 2022.
- [21] Sreekar, R; Zeng, Y; **Zheng, Q**, et al. Nature-based climate solutions for expanding the global protected area network. [Biological Conservation](#). 2022.
- [22] You S#; **Zheng Q**, Wang K, et al. Identifying the spatiotemporal dynamics of forest ecotourism values with remotely sensed images and social media data: a perspective of public preferences [Journal of Cleaner Production](#). 2022.
- [23] Lin Y, Zhang M, Gan M, Huang L, Zhu C, **Zheng Q**, et al. Fine identification of the supply–demand mismatches and matches of urban green space ecosystem services with a spatial filtering tool. [Journal of Cleaner Production](#). 2022.
- [24] Teo HC; Zeng Y; Sarira T; Fung TK; **Zheng Q**, et al. Global urban reforestation can be an

important natural climate solution. [Environmental Research Letter](#). 2021.

*Cited by:* [Lancet Pathfinder Commission 2023](#)

- [25] Ye Y, Huang L, **Zheng Q**, et al. A feasible framework to downscale NPP-VIIRS nighttime light imagery using multi-source spatial variables and geographically weighted regression. [International Journal of Applied Earth Observation and Geoinformation](#). 2021.
- [26] Dong B, **Zheng Q**, Wang K, et al. Identifying and Classifying Shrinking Cities Using Long-Term Continuous Night-Time Light Time Series. [Remote Sensing](#). 2021.
- [27] Ye, Z, **Zheng, Q**, Zhou, R, et al. Mapping and Discriminating Rural Settlements Using Gaofen-2 Images and a Fully Convolutional Network. [Sensors](#). 2020. 20(21), 6062.
- [28] You S, **Zheng Q**, Lin Y, et al. Specific Bamboo Forest Extraction and Long-Term Dynamics as Revealed by Landsat Time Series Stacks and Google Earth Engine. [Remote Sensing](#). 2020.
- [29] Ye Y, Deng J, Huang L, **Zheng Q**, et al. Modeling and Prediction of NPP-VIIRS Nighttime Light Imagery Based on Spatiotemporal Statistical Method. [IEEE Transactions on Geoscience and Remote Sensing](#). 2020.
- [30] Xue X, Lin Y, **Zheng Q**, et al. Mapping the fine-scale spatial pattern of artificial light pollution at night in urban environments from the perspective of bird habitats. [Science of the Total Environment](#). 2020.
- [31] Fu, Y, Li, J, Weng, Q, **Zheng, Q**, et al. Characterizing the spatial pattern of annual urban growth by using time series Landsat imagery. [Science of the Total Environment](#). 2019.
- [32] Shahtahmassebi AR, Wu C, Blackburn GA, **Zheng Q**, et al. How do modern transportation projects impact on development of impervious surfaces via new urban area and urban intensification? Evidence from Hangzhou Bay Bridge, China. [Land Use Policy](#). 2018.
- [33] Xue X, Yu Z, Zhu S, **Zheng Q**, et al. Delineating Urban Boundaries Using Landsat 8 Multispectral Data and VIIRS Nighttime Light Data. [Remote Sensing](#). 2018.
- [34] Huang L, Wu Y, Zheng Q, **Zheng Q**, et al. Quantifying the Spatiotemporal Dynamics of Industrial Land Uses through Mining Free Access Social Datasets in the Mega Hangzhou Bay Region, China. [Sustainability](#). 2018.
- [35] Zheng Q, Wang K, Huang L, **Zheng Q**, et al. Monitoring the Different Types of Urban Construction Land Expansion (UCLE) in China's Port City: A Case Study of Ningbo's Central City. [Sustainability](#). 2018

### Book Chapters

- [1] **Zheng Q\*** Weng Q. Contrasting pattern of urban expansion and urban land-use intensification of global megacities using nighttime light time series data (Chapter 7). [Geospatial Approaches to Sustainable Cities](#). 2024.
- [2] Wang K, Ye Z, Jiang R, **Zheng Q**, et al. Data processing handbook and coastal line dynamic monitoring in [Applications of ZY-02C high-resolution remote sensing data on land resource management](#) (in Chinese). 2017. CMSP press.

### AWARDS & HONORS

**Total: 14 awards with US\$ 38K (International (2), National (2), State (2), University (8))**

- 2021, **Remote Sensing 2021 Best Cover Award**, MDPI, CHF 100
- 2020, Provincial Excellent Doctoral Graduate (Top 5%), Department of Education of Zhejiang Province

- 2020, Excellent Doctoral Graduate of Zhejiang University, Zhejiang University
- 2019, **National PhD Student Award (Top 0.2%)**, Ministry of Education, US\$ 5,000
- 2019, Outstanding PhD Student Scholarship, Zhejiang University, US\$1,500
- 2019, **Student Honors Paper Competition Award (1<sup>st</sup> place)**, Remote Sensing Specialty Group of American Association of Geographers, US\$ 500
- 2019, **IndianaView Student Scholarship Award**, USGS, US\$ 750
- 2019, **Academic Award for Outstanding Doctoral Candidate (Top 100 PhD student, university-wide)**, Zhejiang University
- 2018, Visiting PhD Student Fellowship, China Scholarship Council, US\$ 25,400
- 2018, Graduate Student Travel Award, Zhejiang University, US\$ 1,500
- 2017, Outstanding PhD student scholarship, Zhejiang University, US\$ 1,500
- 2017, Renchao Wang Scholarship (1<sup>st</sup> place), Zhejiang University, US\$ 1,000
- 2016, Outstanding PhD Student, Zhejiang University
- 2015, TOP 100 Best Undergraduate Thesis, Zhejiang University

## GRANTS

### Total: US\$ 74K with PI (3) and Co-I (2)

- [1] **PI:** Supporting both food security and climate change mitigation with abandoned cropland: potential and trade-offs. Start-up Fund for RAP under the Strategic Hiring Scheme, the Hong Kong Polytechnic University, Hong Kong. US\$32,000. 2023-2024.
- [2] **PI:** Building height estimation with context information. Alibaba DAMO Academy – AI Earth Joint Research & Innovation Programme. 2023-2024
- [3] **PI:** Exploring the spatio-temporal pattern of polycentric cities based on night-time light remote sensing data, Zhejiang University, US\$ 7,000, 2019-2020
- [4] **Co-I:** Use of Geo-Artificial Intelligence to Assess the Ecological Impacts of Artificial Light Intrusion in Natural Ecosystems, Microsoft, 2019-2020, US\$ 15,000 (**PI:** Dr. Qihao Weng)
- [5] **Co-I:** Coupling urban spatial structure and urban flood assessment based on multi-source remote sensing data, Zhejiang University, 2017-2018, US\$ 20,000 (**PI:** Dr. Ke Wang)
- [6] **Work package leader.** Understanding the Anthropocene with smart platform. The Ministry of Education (MOE), Social Science Research, Singapore. US\$5M (**Co-PI:** Dr. Lian Pin Koh), 2022-2025.
- [7] **Work package leader.** Decarbonization and Nature-Based Solutions Research Scope and Rationale. Resort World Sentosa, Singapore. US\$ 1M (**Co-PI:** Dr. Lian Pin Koh), 2022-2024.
- [8] **Work package leader.** Digital Climate - Building Platform and Solutions for Urban Heat Risk Mitigation and Decarbonization. The Ministry of Education (MOE) Academic Research Fund, Singapore. US\$ 200k (**Co-PI:** Dr. Lian Pin Koh), 2022-2025.
- [9] **Core member:** Nature for Climate Research Programme (N4CRP)-Ensuring the Credibility and Integrity of the Global Marketplace for Nature-based Climate Solutions, National Research Foundation (Singapore), US\$11.0M (**PI:** Dr. Lian Pin Koh)
- [10] **Core member:** Spatial Optimization and Allocation of Rural Agriculture Production-Living-Ecology Space under Rural Revitalization Initiative, Natural Science Foundation of Zhejiang Province, 2019-2021.
- [11] **Core member:** Application promotion on land and resource management using Chinese high-resolution remote sensing data, The Ministry of Land & Resources of the P.R. China,

2015- 2016.

- [12] **Core member:** Land and resource service system for Chinese high-resolution remote sensing data, The Ministry of Land and Resources of the P.R. China, 2014-2016.

## TEACHING EXPERIENCE

### Lecture & Lab Tutor

- [1] **GRMD3106 Advanced GIS** (3<sup>rd</sup> year undergraduate). The Chinese University of Hong Kong. 2023/2024, Spring.
- [2] **GRMD2104 Remote Sensing of Environment** (2<sup>nd</sup> year undergraduate). The Chinese University of Hong Kong. 2023/2024, Spring.
- [3] **NASA Black Marble VIIRS Nighttime Light Image Processing**. Serial Online Tutorials. (Over 6,000 views; see [Link](#))

### Teaching Assistant

- [1] **Geographic Information Systems and Agricultural Modernization** (undergraduate). Zhejiang University. 2019.

### Guest Lecture

- [1] Nighttime Light Remote Sensing for Urban Applications: Opportunities and Challenges. Wuhan University. Oct. 2023. (Invited speaker)
- [2] Understanding the Urbanizing Planet with Nighttime Light Imagery. Northeastern University, China, May 22, 2023 (Invited lecture).
- [3] Remote Sensing of Urban Environment (Course LSGI 4214 for senior undergraduates). The Hong Kong Polytechnic University. Apr. 4, 2023 (Invited lecture).
- [4] Nighttime Light Remote Sensing for Urban Observation (Course LSGI536 for master students). The Hong Kong Polytechnic University. Mar. 30, 2023 (Invited lecture).
- [5] Remote Sensing of Urban Landscape (Course GE4214 for senior undergraduates). National University of Singapore. Oct. 18, 2022 (Invited lecture).
- [6] Climate Change - Potential of Nature-based Climate Solutions. Civil Service College Singapore & Ministry of Trade and Industry of Singapore. Sept. 7, 2022 (Invited lecture).
- [7] Change detection with remote sensing data: theory, method, and applications. National University of Singapore, Sept. 3, 2021 (Invited lecture).

## MENTORSHIP

### PhD Students

- [1] Baiyu Dong (2021-Present). Zhejiang University.  
Publications: [Remote Sensing](#); [International Journal of Applied Earth Observation and Geo-information](#)
- [2] Shixue You (2020-2022). Zhejiang University;  
Publications: [Journal of Cleaner Production](#); [Remote Sensing](#)

### Master Students

Mengni Xia (2023-2024; HK PolyU); Yang Qu (2023-2024; HK PolyU); Zhenyu Wang (2023-2024; HK PolyU)



### Research Associates/Assistants/Interns

- [3] Te Mu (2023-2024). Zhejiang University & The Hong Kong Polytechnic University
- [4] Tim Ha (2021-2022). National University of Singapore. Publications: [\*Nature Communications\*](#)
- [5] Dennis Tan Wei Jie. 2022-2023. National University of Singapore. Poster presented in NbS conference 2022.
- [6] Nicole Mae Sze Chung. 2021-2022. National University of Singapore. Admission to NUS-Yale college.

### Referrer for students

Mu Te (Glasgow; UCSB; Boston; Curtin); Jia Hu (HKU; Rutgers U); Ke Wang (Florida U; NY Univ); Ning Zhu (NUS); Qingwei Zhong (HKU; CUHK)

## SELECTED TALKS & CONFERENCES

- [1] **Zheng Q.** Impact of temporal compositing on nighttime light data and its applications. *Quantitative Remote Sensing Conference 2023*, Jun. 2023 Chengdu, China.
- [2] **Zheng Q.** Supporting both food security and climate change mitigation with abandoned cropland: potential and trade-offs. *American Geophysical Union Fall Meeting 2022*, Dec. 2022, Chicago, USA.
- [3] **Zheng Q.** Future land-use competition constrains natural climate solutions. *Nature-based Solutions Conference 2022*, July 2022, Oxford, United Kingdom.
- [4] **Zheng Q, Weng Q.** Characterizing urban land changes of global megacities using nighttime light time series. *Symposium 2021 of Group on Earth Observations*, June 2021.
- [5] **Zheng Q.** Earth Observation at Night: Nighttime Light Images Open Up New Applications. September 2019. Indiana State University, USA. (Invited talk)
- [6] **Zheng Q.** Developing a new cross-sensor calibration model for DMSP-OLS and Suomi-NPP VIIRS night-light imageries. *AAG 2019-Annual Meeting of American Association of Geographers*, April 2019, Washington D.C., USA.
- [7] **Zheng Q, Wang K.** Analysis of the spatio-temporal dynamic of polycentric city using nighttime light remote sensing imagery. *IGARSS 2018 - 2018 IEEE International Geoscience and Remote Sensing Symposium*, July 2018, Valencia, Spain.
- [8] **Zheng Q, Wang K.** Monitoring “ghost cities” in China from the view of night-time light remote sensing data. *Workshop of “Sustainable Systems and Societies: energy, environment and policy frameworks”*, November 2016, Campinas, Brazil.

## PROFESSIONAL ACTIVITIES

### Editorship

- [1] **Editorial board member**, [\*ISPRS Journal of Photogrammetry and Remote Sensing\*](#). 2022-present
- [2] **Guest editor**. [\*Remote Sensing\*](#). Special Issue: Remote Sensing Imagery For Mapping Economic Activities. 2021-2022

### Conference convener

- [1] **Session panel.** Session: Urbanization, Coastal Vulnerability, and Sustainability (VI): Earth at Night - What can and can't be seen? AAG 2019-Annual Meeting of American Association of Geographers, April 2019, Washington D.C., USA.
- [2] **Session chair.** Session: Remote Sensing Image Classification. 5th International Workshop on Earth Observation and Remote Sensing Applications, June 2018, Xi'an, China.

#### **Assessment committee member**

- [1] Defense of final year project of undergraduate students. The Hong Kong Polytechnic University. Spring, 2023.
- [2] Dissertation Defense of Master students. The Hong Kong Polytechnic University. Spring, 2023.
- [3] AGU Outstanding Student Presentation Awards program. 2022/2023

#### **Funding Agency reviewer**

- [1] Proposal reviewer. Israel Science Foundation. 2024

#### **Journal reviewer (Total: 165)**

ISPRS J Photogramm Remote Sens (24)	Int J Appl Earth Obs Geoinf. (7)
Remote Sensing of Environment (10)	PNAS-Nexus (2)
IEEE TGRS (3)	Applied Geography (10)
IEEE Access (7)	Energy Efficiency (1)
Sustainable Cities and Society (3)	International Journal of Remote Sensing (4)
Scientific Report (2)	Journal of Cleaner Production (2)
IEEE J-STARS (31)	Advances in Space Research (1)
Science of the Total Environment (3)	Earth System Science Data (1)
Cities (1)	Environmental Research Letters (6)
Remote Sensing (6)	Geo-Spatial Information Science (3)
Int J Digit Earth (6)	Remote Sensing Applications (3)
Building and Environment (5)	Remote Sensing Letter (1)
GIScience & Remote Sensing (6)	Journal of Environmental Management (3)
Annual of GIS (2)	Journal of Spatial Science (1)
Envir Res: Infrastructure and Sustainability (1)	IEEE TGRS Letter (3)
Urban Informatics (1)	Applied Energy (1)
Resources, Conservation & Recycling (2)	Geocarto International (2)
European Journal of Remote Sensing (1)	

## **SKILLS**

**Languages:** English (fluent; TOEFL: 105/120); Mandarin (native); Cantonese (basic)

**Technical Tools:** ArcGIS/ArcGIS Pro/ArcPy, Matlab, Python, R, Google Earth Engine, Linux, HPC, ENVI, Weka, eCognition;

**Teaching certificate:** Introduction to University Teaching training program (with certificate from HK PolyU).

## **PROFESSIONAL MEMBERSHIP**



American Association of Geographers  
American Geophysical Union

IEEE Geoscience and Remote Sensing Society  
International Society for Photogrammetry and  
Remote Sensing