





# SHENGJIE KRIS LIU

# CURRICULUM VITAE

Spatial Sciences Institute  
University of Southern California  
3616 Trousdale Pkwy, AHF B55  
Los Angeles, CA 90089

liusheng@usc.edu  
skrisliu@gmail.com  
<https://skrisliu.com>

- Research** Remote Sensing, Machine Learning, AI for Earth, Urban Climate, Artificial Light at Night
- Education & Training**
-  **University of Southern California** 8/2021 – present  
PhD in Population, Health and Place
  -  **The University of Hong Kong** 10/2019 – 8/2021  
RA of Artificial Light at Night
  -  **Sun Yat-Sen University** 8/2015 – 6/2019  
BSc in Geographical Information Science
- Publications** **Articles in peer-reviewed journals**
- [19] Racial and Ethnic Minorities Disproportionately Exposed to Extreme Daily Temperature Variation in the United States  
**Shengjie Liu**, Emily Smith-Greenaway  
*PNAS Nexus* 2024
  - [18] Deep Feature Gaussian Processes for Single-Scene Aerosol Optical Depth Reconstruction  
**Shengjie Liu**, Lu Zhang  
*IEEE GRSL – IEEE Geoscience and Remote Sensing Letters* 2024
  - [17] Effects of socioeconomic status and greenspace on respiratory emergency department visits under short-term temperature variations: An age-stratified case time-series study  
**Shengjie Liu**, Hung Chak Ho  
*Social Science & Medicine* 2024
  - [16] Spatial variability of diurnal temperature range and its associations with local climate zone, neighborhood environment and mortality in Los Angeles  
**Shengjie Liu**, An-Min Wu, Hung Chak Ho  
*Urban Climate* 2023
  - [15] Multiple Angle Observations Would Benefit Visible Band Remote Sensing Using Night Lights  
Christopher CM Kyba, Martin Aubé, Salvador Bará, Andrea Bertolo, Constantinos A Bouroussis, Stefano Cavazzani, Brian R Espey, Fabio Falchi, Geza Gyuk, Andreas Jechow, Miroslav Kocifaj, Zoltán Kolláth, Héctor Lamphar, Noam Levin, **Shengjie Liu**, Steven D Miller, Sergio Ortolani, Chun Shing Jason Pun, Salvador José Ribas, Thomas Ruhtz, Alejandro Sánchez de Miguel, Matthias Schneider, Ranjay Man Shrestha, Alexandre Simoneau, Chu Wing So, Tobias Storch, Kai Pong Tong, Diane Turnshek, Ken Walczak, Jun Wang, Zhuosen Wang, Jianglong Zhang  
*JGR Atmospheres – Journal of Geophysical Research: Atmospheres* 2022
  - [14] Crop Mapping Using Sentinel Full-Year Dual-Polarized SAR Data and a CPU-Optimized Convolutional Neural Network With Two Sampling Strategies  
**Shengjie Liu**, Zhize Zhou, Huaxiang Ding, Yuanjun Zhong, Qian Shi  
*IEEE J-STARS – IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* 2021
  - [13] Few-shot Hyperspectral Image Classification with Unknown Classes Using Multitask Deep Learning  
**Shengjie Liu**, Qian Shi, Liangpei Zhang  
*IEEE TGRS – IEEE Transactions on Geoscience and Remote Sensing* 2021  
 **ESI Highly Cited Paper**
  - [12] Active Ensemble Deep Learning for Polarimetric Synthetic Aperture Radar Image Classification  
**Shengjie Liu**, Haowen Luo, Qian Shi  
*IEEE GRSL – IEEE Geoscience and Remote Sensing Letters* 2021

- [11] Local Climate Zone Mapping as Remote Sensing Scene Classification Using Deep Learning: A Case Study of Metropolitan China  
**Shengjie Liu**, Qian Shi  
*ISPRS Journal of Photogrammetry and Remote Sensing* 2020
- [10] Multitask Deep Learning With Spectral Knowledge for Hyperspectral Image Classification  
**Shengjie Liu**, Qian Shi  
*IEEE GRSL – IEEE Geoscience and Remote Sensing Letters* 2020
- [9] Integration of Convolutional Neural Networks and Object Based Post-Classification Refinement for Land Use and Land Cover Mapping with Optical and SAR Data  
**Shengjie Liu**, Zhixin Qi, Xia Li, Anthony Gar-On Yeh  
*Remote Sensing* 2019

#### Articles in peer-reviewed conference proceedings

- [8] Using time-series satellite imagery to detect artificial light at night: The case of Luojia-1 and International Space Station  
**Shengjie Kris Liu**, Chu Wing So, Jason Chun Shing Pun  
Accepted to *IGARSS – IEEE International Geoscience and Remote Sensing Symposium* 2024  
🎤 oral presentation
- [7] Fine-scale mapping of particulate matter using Landsat imagery and low-cost sensor data from PurpleAir: A case study of Los Angeles  
**Shengjie Kris Liu**, Siqin Wang  
Accepted to *IGARSS – IEEE International Geoscience and Remote Sensing Symposium* 2024  
🎤 oral presentation
- [6] Using high-resolution nighttime remote sensing data to identify light sources in Hong Kong  
**Shengjie Liu**, Chu Wing So, Hung Chak Ho, Qian Shi, Chun Shing Jason Pun  
*IGARSS – IEEE International Geoscience and Remote Sensing Symposium* 2023  
🎤 oral presentation
- [5] Using multisource data to capture the impacts of Earth Hour 2021: A case study of Hong Kong  
**Shengjie Liu**, Chu Wing So, Xiang Feng Foo, Chun Shing Jason Pun  
*IGARSS – IEEE International Geoscience and Remote Sensing Symposium* 2023  
🎤 oral presentation
- [4] Estimating PM2.5 and PM10 on Zhuhai-1 hyperspectral imagery  
**Shengjie Liu**, Qian Shi  
*IGARSS – IEEE International Geoscience and Remote Sensing Symposium* 2022  
🎤 oral presentation
- [3] Analyzing long-term artificial light at night using VIIRS monthly product with land use data: Preliminary result of Hong Kong  
**Shengjie Liu**, Chu Wing So, Chun Shing Jason Pun  
*IGARSS – IEEE International Geoscience and Remote Sensing Symposium* 2021
- [2] Multi-label local climate zone mapping as scene classification using very high resolution imagery: Preliminary result of Hong Kong  
**Shengjie Liu**, Qian Shi  
*IGARSS – IEEE International Geoscience and Remote Sensing Symposium* 2021
- [1] Wide contextual residual network with active learning for remote sensing image classification  
**Shengjie Liu**, Haowen Luo, Ying Tu, Zhi He, Jun Li  
*IGARSS – IEEE International Geoscience and Remote Sensing Symposium* 2018

#### Abstracts in peer-reviewed conferences

presenter marked with \*

- [A9] Disparities in Daily Temperature Variation Exposure Across U.S. Population and Income Groups  
**Shengjie Liu\***  
Submitted to *AGU – American Geophysical Union Annual Meeting* 2024

- [A8] High inequality of artificial light due to commercial and sports lighting in Hong Kong  
**Shengjie Liu\***, Chu Wing So, Hung Chak Ho, Qian Shi, Chun Shing Jason Pun  
**ALAN** – International Conference on Artificial Light At Night 2023  
 oral presentation
- [A7] Association between indoor lux measurements and outdoor wall brightness in the high-rise urban environment of Hong Kong  
 Chu Wing So\*, **Shengjie Liu**, Chun Shing Jason Pun  
**ALAN** – International Conference on Artificial Light At Night 2023  
 oral presentation
- [A6] Using multi-source data to capture the impacts of Earth Hour 2021 in Hong Kong  
 Chun Shing Jason Pun\*, Chu Wing So, Xiang Feng Foo, **Shengjie Liu**  
**ALAN** – International Conference on Artificial Light At Night 2023
- [A5] Measurement of cloud amplification effect over a wide range of night sky brightness observations with the GaN-MN  
 Chun Shing Jason Pun, Chu Wing So\*, **Shengjie Liu**, Lina Canas, Constance E. Walker, Sze Leung Cheung  
**LPTMM** – Light Pollution: Theory, Modelling and Measurements International Conference 2022
- [A4] Analyzing the sources and variations of night lights between 2012 and 2019 in Hong Kong from VIIRS monthly products  
 Chun Shing Jason Pun, Chu Wing So, **Shengjie Liu\***  
**LPTMM** – Light Pollution: Theory, Modelling and Measurements International Conference 2022  
 oral presentation
- [A3] The relationship between night sky brightness and remote sensing data: Preliminary result from Luojia-1 and the International Space Station  
**Shengjie Liu\***, Chu Wing So, Chun Shing Jason Pun  
**ALAN** – International Conference on Artificial Light At Night 2021  
 oral presentation
- [A2] A multinational study of night sky brightness (NSB) patterns: Preliminary results from the Globe at Night – Sky Brightness Monitoring Network (GaN-MN) – Study of cloud amplification on NSB  
 Chu Wing So\*, Nok Yan Janet Chang, **Shengjie Liu**, Lina Canas, Constance E. Walker, Sze Leung Cheung, Chun Shing Jason Pun  
**ALAN** – International Conference on Artificial Light At Night 2021  
 oral presentation
- [A1] A multinational study of night sky brightness patterns: Preliminary results from the Globe at Night – Sky Brightness Monitoring Network (GaN-MN)  
 Chun Shing Jason Pun\*, Chu Wing So, Nok Yan Janet Chang, **Shengjie Liu**, Lina Canas, Constance E. Walker, Sze Leung Cheung  
**ALAN** – International Conference on Artificial Light At Night 2020  
 oral presentation

#### Invited talks & Guest lectures

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|--|---------|
| The University of Hong Kong: Advanced Urban Remote Sensing Workshop<br><i>Disproportionate distribution of artificial light at night in Hong Kong: evidence from space with high-resolution nighttime remote sensing</i>                       | 12/2022 |
| University of Southern California, Los Angeles<br>SSCI-382 Geographic Information Science: Spatial Analytics.<br><i>Urban Heat Islands with Nighttime and Daytime Landsat Imagery</i>  | 10/2022 |
| East China Normal University, Shanghai: The 3rd Urban Remote Sensing Workshop<br><i>Two cases of deep learning remote sensing image classification: local climate zone mapping and fine-grained classification considering unknown classes</i> | 10/2020 |

#### Awards & Scholarships

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| USC Spatial Sciences Institute Travel Grant 2024 | 7/2024 |
| 2024 Dornsife PhD Academy Scholarship            | 5/2024 |
| IEEE IGARSS 2024 Travel Grant                    | 4/2024 |
| 2023 Dornsife PhD Academy Scholarship            | 5/2023 |

	2022 Dornsife PhD Academy Scholarship	5/2022
	USC Spatial Sciences Institute Fellowship for Incoming Students <i>Stipend for 6 months</i>	08/2021 – 05/2026
	USC Dornsife College/Graduate School Fellowship for Incoming Students <i>Stipend for 18 months</i>	08/2021 – 05/2026
	GitHub Arctic Code Vault Contributor	2/2020
	Finalist, Zhuhai Orbita Hyperspectral Data Processing Paper Contest	11/2019
	IEEE IGARSS 2018 Travel Grant	4/2018
	SYSU EMBA Alumni Association Scholarship	6/2018
	National Undergraduate Innovative Project	6/2018
	First-class Fellowship for Outstanding Undergraduates	6/2018
<b>Research projects</b>	<b>Participated funded projects</b> (paid my salary)	
	NIH - National Institute of Environmental Health Sciences (P30ES007048) Subcontract via Southern California Environmental Health Sciences Center <i>Assessing Particulate Matter Exposures Based on Multi-Source Satellite Data Using Scalable Gaussian Process Models</i> (PI: Lu Zhang)	8/2023 – 5/2024
	Environment and Conservation Fund of Hong Kong Government <i>Effects of external lighting on the environment</i> (2018-125, PI: Jason C.S. Pun)	10/2019 – 8/2021
	HKU Knowledge Exchange Fund, University Grants Committee of Hong Kong Grant No. KE-IP-2019/20-54, KE-IP-2020/21-78 (PI: Jason C.S. Pun)	10/2019 – 8/2021
	Guangdong Basic and Applied Basic Research Foundation Grant No. 2019A1515011057 (PI: Qian Shi)	1/2019 – 9/2019
	National Natural Science Foundation of China Grant No. 61601522, 61976234 (PI: Qian Shi)	9/2018 – 9/2019
<b>Teaching</b>	<b>University of Southern California</b>	
	SSCI-214 Human Populations and Natural Hazards <i>Instructor of Record for discussion sessions</i>	Fall 2024
	SSCI-382 Geographic Information Science: Spatial Analytics <i>Instructor of Record for lab sessions</i>	Spring 2023
	SSCI-220 Spatial Data Collection Using Drones <i>Instructor of Record for lab sessions</i>	Spring 2023
	SSCI-165 Sustainability Science in the City <i>Instructor of Record for lab sessions</i>	Fall 2022
<b>Service &amp; Membership</b>	<b>Journal editorship</b>	
	Topic Coordinator in Frontiers in Environmental Science <i>Navigating the Night: Insights into Technology, Ecology, and Public Perception of Artificial Light</i> with Zhuosen Wang, Xi Li, and Alejandro Sánchez de Miguel	
	<b>Conference organization</b>	
	Scientific Committee, IGARSS 2024	
	Session Chair, with Zhuosen Wang, IGARSS 2024 <i>Nighttime Light Remote Sensing for Sustainable Development Goals</i>	
	Session Chair, with Jie Feng, IGARSS 2023 <i>Hyperspectral Imaging Classification</i>	
	<b>Peer-review referee</b>	
	IEEE Transactions on Geoscience and Remote Sensing (6)	
	IEEE Geoscience and Remote Sensing Letters (2)	
	IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (19)	
	Remote Sensing Letters (3)	
	Expert Systems With Applications (2)	
	Knowledge-Based Systems (6)	
	Pattern Recognition Letters (5)	

*Earth Science Informatics* (2)  
*International Journal of Digital Earth* (2)  
*Journal of Asian Architecture and Building Engineering* (4)  
*Sustainable Cities and Society* (1)  
*Urban Climate* (17)  
*International Journal of Biometeorology* (1)  
*Environmental Research* (1)  
*Scientific Reports* (2)

### Membership

American Geophysical Union (AGU)  
 European Geosciences Union (EGU)  
 IEEE Geoscience and Remote Sensing Society (GRSS)  
 IEEE GRSS Image Analysis and Data Fusion (IADF) Technical Committee

### Open Science

**MDL4OW** – Multitask deep learning for open-world hyperspectral image classification 9/2020 –  
 50+ stars on GitHub. First open-set classification method in remote sensing.  
 Baseline method in 20+ published papers.

🔗 <https://github.com/sjliu68/MDL4OW>

**LCZNet** – Local climate zone mapping in metropolitan China 4/2020 –  
 Local climate zone maps in the Greater Bay Area (including Hong Kong, Guangzhou, Shenzhen, and Macau), Shanghai, Beijing.

🔗 <https://sjliu.me/lcz>

**Remote Sensing Image Classification** 8/2019 –  
 100+ stars on GitHub.

Baseline method implementation for classic remote sensing image classification, including Contextual CNN (IEEE TIP), WCRN (IEEE GRSL), OBPR, DBMA, and HResNet (IEEE TGRS).

🔗 <https://github.com/sjliu68/Remote-Sensing-Image-Classification>

### Science outreach & selected media coverage

**The Conversation:** *Large daily temperature swings can harm human health* 8/2024  
 Covered by United Nations PreventionWeb, Fast Company, Medical Xpress, Yahoo News, MSN-Microsoft, USC Dornsife, Tolerance Webzine Canada, Inverse, SFGATE San Francisco, Qatar Tribune, Macau Daily Times, Foreign Affairs New Zealand.

**USC Dornsife:** *Extreme temperature swings hit minority, low-income communities hardest* 5/2024  
 Covered by Yahoo News, MSN-Microsoft, RAI Bolivia.

**Science Magazine:** *Light pollution is drowning the starry night sky faster than thought* 1/2023  
 Covered by Smithsonian Magazine, Science News, Tech Times, The Daily Beast, Le Monde.

**Radio Television Hong Kong (RTHK):** *Light Pollution Hong Kong* 10/2020  
 Featured in Talk Show — Science Night

— Last updated in August 2024