



# Juwon Kong

Postdoctoral associate

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## CAREER

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2023.09-present      Seto Lab, Yale School of Environment, Yale University  
2023.03-2023.08      Ryu Lab, College of Agriculture and Life Science, Seoul National University

## RESEARCH INTEREST

**Satellite remote sensing; Image fusion; CubeSat; Geostationary satellite; Vegetation monitoring; Heterogeneous landscape; Urbanization**

## EDUCATION

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2023      **Seoul National University**, Seoul, Republic of Korea  
Engineering Doctor of Philosophy  
- Interdisciplinary Program in Landscape Architecture  
- Integrated Major in Smart City Global Convergence  
Advisor: Prof. Youngryel Ryu (<https://www.environment.snu.ac.kr/>)  
Thesis: Monitoring vegetation changes by enhancing the spatiotemporal resolution of satellite imagery

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2019      **Seoul National University**, Seoul, Republic of Korea  
Master's degree in  
- Landscape Architecture  
Advisor: Prof. Youngryel Ryu (<https://www.environment.snu.ac.kr/>)  
Thesis: Inter-comparison of image fusion products against in-situ spectral measurements over a heterogeneous rice paddy landscape

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2017      **Seoul National University**, Seoul, Republic of Korea  
Bachelor's degree in  
- Science of Agriculture (Landscape Architecture Major)  
- Science in Environmental Management

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## PUBLICATIONS

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- 2024 Jeong, S., Ryu, Y., Gentine, P., Lian, X., Fang, J., Li, X., Dechant, B., **Kong, J.**, Choi, W., Jiang, C., Keenan, T. F., Harrison, S., Prentice, I.C. (2024) Persistent global greening over the last four decades using novel long-term vegetation index data with enhanced temporal consistency. *Remote Sensing of Environment*
- 2024 Jeong, S., Ryu, Y., Li, X., Dechant, B., Liu, J., **Kong, J.**, Choi, W., Fang, J., Lian, X., Gentine, P. (2024) GEOSIF: A continental-scale sub-daily reconstructed solar-induced fluorescence derived from OCO-3 and GK-2A over Eastern Asia and Oceania. *Remote Sensing of Environment*
- 2023 **Kong, J.**, Ryu, Y., Jeong, S., Zhong, Z., Choi, W., Kim, J., Lee, K., Lim, J., Jang, K., Chun, J., Kim, K.-M., & Houborg, R. (2023). Super resolution of historic Landsat imagery using a dual generative adversarial network (GAN) model with CubeSat constellation imagery for spatially enhanced long-term vegetation monitoring. *ISPRS Journal of Photogrammetry and Remote Sensing*, 200, 1-23
- 2023 Jeong, S., Ryu, Y., Dechant, B., Li, X., **Kong, J.**, Choi, W., Kang, M., Yeom, J., Lim, J., Jang, K., & Chun, J. (2023). Tracking diurnal to seasonal variations of gross primary productivity using a geostationary satellite, GK-2A Advanced Meteorological Imager. *Remote Sensing of Environment* 284
- 2022 **Kong, J.**, Ryu, Y., Liu, J., Dechant, B., Rey-Sanchez, C., Shortt, R., Szutu, D., Verfaillie, J., Houborg, R., & Baldocchi, D.D. (2022). Matching high resolution satellite data and flux tower footprints improves their agreement in photosynthesis estimates. *Agricultural and Forest Meteorology*, 316, 108878 (**Editor's Choice in Feb 2022**)
- 2021 **Kong, J.**, Ryu, Y., Huang, Y., Dechant, B., Houborg, R., Guan, K., Zhu, X. (2021) Evaluation of four image fusion NDVI products against in-situ spectral-measurements over a heterogeneous rice paddy landscape. *Agricultural and Forest Meteorology* 297, 108255.

### Manuscript in Progress

- Under review Zhong, Z., Ryu, Y., **Kong, J.**, Kwon, R., Clausi, D.A., Wong, A., Lee, K. (2024) CloudFormer: Transformer Networks for Cloud and Cloud Shadow Detection on Landsat-8 and Sentinel-2 Images. (submitted)
- Under review Choi, W., Ryu, Y., **Kong, J.**, Jeong, S., Lee, K. (2024) Evaluation of spatial and temporal variability in Sentinel-2 surface reflectance on a rice paddy landscape. Submitted
- In preparation **Kong, J.**, Clark, J., Pregitzer, C., Jevon, F., Houborg, R., Karen, S. (2024), Climate Change Effects on Urban Parks: Shifts in Phenological Patterns of Urban Trees. (To be submitted)

In preparation **Kong, J.**, Ryu, R., Dechant, B., Jeong, S., Kim, J., Lee, K., Ku, B., Houborg, R. (2024) CubeSat-based rice yield estimation: evaluating performance with in in-situ data and quantifying benefits of high spatiotemporal resolution (To be submitted)

## CONFERENCE

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- 2023 Hahn, S., Ryu, Y., **Kong, J.**, Choi, W., Evaluation of the performance of image fusion products using drone-based hyperspectral imagery on multiple land covers, AGU Fall Meeting Abstracts 2023
- 2023 Jeong, S., Ryu, Y., Gentine, P., Lian, X., Fang, J., Li, X., **Kong, J.**, Choi, W., Jiang, C., Keenan, T., Harrison, S., Prentice, I., Temporally Consistent Vegetation Indices Show Persistent Greening Trend Over Four Decades, AGU Fall Meeting Abstracts 2023
- 2023 Choi, C., Ryu, R., Yang, T., Kwon, R., Jeong, S., **Kong, J.**, Forest Height Estimation: An Adaptive Deep-learning Approach Incorporating PFTs and Vegetation Seasonality, AGU Fall Meeting Abstracts 2023
- 2023 Kwon, R., Ryu, Y., Feng, H., Jeong, S., **Kong, J.**, Choi, C., Maize Mapping and Productivity Forecasting without In-situ Labels, Leveraging Artificial Intelligence and Cloud-computed Multi-Source Data, AGU Fall Meeting Abstracts 2023
- 2022 **Kong, J.**, Ryu, Y., Jeong, S., Zhong, Z., Choi, W., Kim, J., Houborg, R., Super Resolution of Historic Landsat Imagery Using a GAN model with CubeSat Constellation Imagery, AGU Fall Meeting Abstracts 2022
- 2022 Zhong, Z., Ryu, Y., **Kong, J.**, Lee, J., Yan, Y., Kwon, R., Yang, T., Feng, H., Transformer Networks for Cloud and Cloud Shadow detection in Landsat-8 and Sentinel-2 Imagery, AGU Fall Meeting Abstracts 2022
- 2022 Jeong, S., Ryu, Y., Li, X., Dechant, B., **Kong, J.**, Choi, W., GEO-SIF: A continental-scale, hourly reconstructed solar-induced fluorescence product derived from OCO-3 and GK-2A over Eastern Asia and Oceania, AGU Fall Meeting Abstracts 2022
- 2021 **Kong, J.**, Ryu, Y., Jeong, S., Choi, W., Mamo, H., Generating Daily Gap-filled BRDF Adjusted Surface Reflectance Products with 10 m Resolution Using Geostationary Satellite, AGU Fall Meeting Abstracts 2021
- 2021 Choi, W., Ryu, Y., **Kong, J.**, Jeong, S., Drone Based Evaluation of Spatial Variability in Satellite Surface Reflectance Products, AGU Fall Meeting Abstracts 2021
- 2020 **Kong, J.**, Ryu, Y., Dechant, B., Jeong, S., Choi, W., Characterization of the spatial variability of bidirectional reflectance distribution function

- parameters over a heterogeneous rice paddy landscape, AGU Fall Meeting Abstracts 2020
- 2020 Jeong, S., Ryu, Y., **Kong, J.**, Choi, W., Generating Diurnal to Seasonal Bidirectional Reflectance Factors from GK-2A Geostationary Satellite
- 2019 **Kong, J.**, Ryu, Y., Houborg, R., Kang M., Monitoring canopy photosynthesis in high spatial and temporal resolution using CubeSat imagery, AGU Fall Meeting Abstracts 2019
- 2019 Li B., Ryu Y., Dechant B., **Kong, J.**, Yan Y., Kang, M., Estimation of Rice Paddy Methane Emissions from Continuous Meteorological and Hyperspectral Observations with Deep Learning, AGU Fall Meeting Abstracts 2019
- 2018 **Kong, J.**, Ryu, Y., Huang, Y., Guan, K., Houborg, R., Zhu, X., Evaluation of three high spatio-temporal image fusion products using in-situ spectral measurements, AGU Fall Meeting Abstracts 2018
- 2017 **Kong, J.**, Ryu, Y., Quantifying the Uncertainty in High Spatial and Temporal Resolution Synthetic Land Surface Reflectance at Pixel Level Using Ground-Based Measurements, AGU Fall Meeting Abstracts 2017

## JOURNAL REVIEWERS

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- Remote Sensing of Environment (18 submissions)  
 Science of Remote Sensing (3 submissions)  
 Agricultural and Forest Meteorology (2 submissions)

## PATENT

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- 2024 Ryu, Y., **Kong, J.**, Jeong, S., (2024), Method and system for improving spatial resolution of past satellite image for long term vegetation monitoring using dual generative adversarial neural network model and cube satellite image
- 2021 Ryu, Y., Choi, W., Jeong, S., **Kong, J.**, (2021) Drone based bidirectional reflectance distribution function measurement method and system, Korean Intellectual property Office, Republic of Korea
- 2021 Ryu, Y., **Kong, J.**, Jeong, S., Mamo H., Choi, W. (2021) Daily image fusion product using geostationary satellite imagery. Korean Intellectual Property Office, Republic of Korea.

## TEACHING ASSISTANT

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2019	Teaching Assistant, Ecological Analysis in Landscape Studies, Seoul National University
2019	Teaching Assistant, Urban Park planning, Seoul National University
2018	Teaching Assistant, Ecological Analysis in Landscape Studies, Seoul National University
2017	Teaching Assistant, Urban Park planning, Seoul National University

## AWARDS

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2022	Excellent Research Award by BrainKorea21
2018	Student Poster Award winner (2nd) in Potsdam GHG Flux Workshop

## SCHOLARSHIPS

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2021 Spring/Fall 2020 Fall	Government Scholarship, Brain Korea 21 (BK21) FOUR, Innovative Human Resource Development Education and Research Group for Smart City Global Convergence, Republic of Korea
2020 Spring	Government Scholarship, Brain Korea 21 (BK21) Plus, Global leadership program towards innovative green infrastructure, Republic of Korea
2020 Spring 2019 Spring/Fall 2018 Fall 2017 Spring	Lecture and Research Support Scholarship, Seoul National University, Seoul, Republic of Korea
2018 Spring 2017 Fall	Full tuition scholarship (Excellent grades), Seoul National University, Seoul, Republic of Korea

## EXPERIMENTAL FACILITIES

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Spectral Reflectance	Hyperspectral spectroradiometer (Jaz spectrometer, Ocean Optics, Dunedin, FL, USA) Hyperspectral spectroradiometer (ASD fieldspec4, Malvern Panalytica Boulder, CO, USA) Hyperspectral imager, (Nano-Hyperspec VNIR model; Headwall Photonics, Fitchburg, MA, USA)
Photosynthesis measurements	Portable gas exchange system (LI-6400 LI-COR Inc., Lincoln, NE, USA) Portable gas exchange system (LI-6800 (LI-COR Inc., Lincoln, NE, USA)
Aerial system	Remotely piloted hexa-copter (DJI-M600Pro DJI, China)

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LiDAR system	Terrestrial LiDAR system (RIEGL VZ-400i, RIEGL, Horn, Austria)
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## PROGRAMMING AND SOFTWARE

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MATLAB (in both desktop and server)

Python (in both desktop and server)

QGIS

Google Earth Engine

Adobe Illustrator

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## MEMBERSHIPS

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2023-present	Member, Global Land Programme
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2017-present	Member, American Geophysical Union
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## LICENSE / CERTIFICATE

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2021	Pilot of an ultra-light vehicle: unmanned multicopter / 1 <sup>st</sup> , Korea Transportation Safety Authority
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2017	SNU Green Leadership Certificate Program, certified by The Ministry of Environment (Republic of Korea)
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2016	Certified MATLAB associate, MathWorks
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2016	Image Processing with MATLAB, MathWorks
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2016	MATLAB Fundamentals, MathWorks
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## LANGUAGES

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Korean	Native
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English	Advanced-Intermediate
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## DUTY

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2014, November	-	Auxiliary police in Police Force, Seoul, Republic of Korea
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2016, August		
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## VOLUNTEERING ACTIVITIES

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2018	(April - November)	SNU mentoring: Educating and mentoring for high
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	school student, Seoul National University Social Responsibility
2018	(March) Helping a student to learn Korean language and Korean culture, Seoul National University Korean Language Education Center
2017	(April - November) SNU mentoring: Educating and mentoring for middle school student, Seoul National University Social Responsibility
2014	(August - December) SNU BUDDY: Helping exchange students or visiting students, Seoul National University Social Responsibility
2014	(March - June) SNU BUDDY: Helping exchange students or visiting students, Seoul National University Social Responsibility
2011	(March - July) SNU SAM mentoring: Educating and mentoring for elementary schoolchild, Seoul National University
2009	(March - June) Education Mentor, Educating and mentoring for low-income family child, Seoul National University

## INTERNSHIPS

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2013 Summer	Corporate Social Responsibility Team, Samsung Engineering, Seoul, Republic of Korea
2013 Winter	Climate Change Center, National Institute of Forest Science, Seoul, Republic of Korea

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## ACTIVITIES

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2011-2014	SNU American football team 'Green Terrors'
2009-2010	SNU football club 'Soccer21'
2009-2013	Leisure sports club 'UNIT'