I Website Mnk@berkeley.edu 🕿 Scholar | 📓 ResearchGate | 🎽 Twitter | ORCID

Minho Kim

Research Interests

- Geospatial Analysis: Remote Sensing, Computer Vision, GIScience, Network Science
- Machine Learning: Deep Learning, GeoAI, Explainable AI
- Environmental Planning: Risk & Resilience, Natural Hazards, Sustainable Development

EDUCATION

 California, Berkeley Ph.D. Environmental Planning Dissertation: Data-Driven Planning for Resilience Against Natural Hazard Risks Advisors: Marta C. González, John Radke Exam Committee: John Radke, Marta C. González, Iryna Dronova, Solomon Hsia 	Sep 2021 – Present
 Seoul National University M.S. Civil & Environmental Engineering Thesis: Local Climate Zone Classification Using Multi-Scale Convolutional Network Advisor: Yongil Kim 	Mar 2017 – Feb 2021 rks
 Seoul National University B.S. Civil & Environmental Engineering Thesis: Monitoring North Korea's 4th Nuclear Test Site with Sentinel-1A Data Us Advisor: Yongil Kim 	Sep 2012 – Feb 2017 sing DInSAR

Research Experience

Researcher (Center for Catastrophic Risk Management)

- System-level governance frameworks for catastrophic risk management
- Reviewed natural hazard modeling and data sources for catastrophic wildfire events

Visiting Researcher (Catalan Fire Service)

Advisor: Marc Castellnou

- Modeled fire potential polygons and networks using simulations and hydrology-inspired tools for fire suppression decision support [W3]
- Improved existing WUI maps using automatic structural separation distance and permeability metrics
- Measured shared responsibility metrics in WUI map areas in Catalonia [W5]

\Box Graduate Student Researcher (River Lab, Funded by CalTrans) May 2023 – June 2024 Advisors: Mathias Kondolf, John Radke UC Berkeley

- Developed methodology to estimate bulking factors and protect critical infrastructure against debris flows
- Built GUI used to aggregate data APIs and GIS data layers related to post-fire debris flow probability

Graduate Student Researcher (HuMNet Lab, Funded by C3.AI) Advisor: Marta C. González, Mentor: Cristobal Pais

- Generated physics-based, semi-empirical data computed in R to integrate into a cellular automata simulator (C++) to conduct fire spread simulations [W2].
- High resolution mapping of fuels and vegetation using deep learning [C10].

Research Assistant (SPINS-RS Lab)

Advisor: Yongil Kim

Mar 2019 - Feb 2021 Seoul National University

- Urban Remote Sensing: Generated high resolution Local Climate Zone classification maps multi-scale CNNs (~80% accuracy) [C7] and multi-scale, multi-level attention CNNs (~90% accuracy) trained with multitemporal Sentinel-2 images and multi-modal GIS data [P4].
- Renewable Energy: Predicted photovoltaic power of solar farms with high precision (< 5% Normalized MAE) using large-scale time series of multitemporal geostationary satellite images and multi-source meteorological data [C2], [C4], [P3].

Jan 2022 – present

Jan 2025 – Present

July 2024 - Sep 2024

Barcelona, Spain

UC Berkeley

- Image Fusion: Developed a spatiotemporal image fusion model in Matlab to produce disaggregated Landsat-8 thermal images in heterogeneous urban areas [C6].
- Change Detection/Monitoring: Applied radiometric calibration to help detect and monitor burn scars using change detection results from multitemporal Sentinel-2 and PlanetScope images [C3], [P2].

Undergraduate Research Assistant (SPINS-RS Lab)

Advisor: Yongil Kim

- Analyzed ground deformations in inaccessible, remote areas using dInSAR with Sentinel-1 SAR images.
- Carried out fieldwork and experiments using a ground-based hyperspectral imager to monitor crop health.

Research Assistant (Lawson Health Research Institute)

Advisor: Jeffrey Carson

• Photoacoustic image reconstruction of a line source using multiple regularization percentages with maximum intensity projection using Matlab.

WORK EXPERIENCE

\Box Researcher at Institute of Construction & Env. Eng.	Mar 2021 – Aug 2021
Advisor: Yongil Kim	Seoul National University
• Developed high resolution land cover maps of inaccessible areas using resolution satellite imagery [C8].	deep learning with very high
\square PR Manager	$Mar \ 2021 - Aug \ 2021$
Education & Research Program (InfraSPHERE)	Seoul National University
Lab Manager	Mar 2021 – Aug 2021
SPINS-RS Lab	Seoul National University

Honors & Awards

Outstanding Graduate Student Instructor Award	April 2024
V UC Berkeley (GSI Teaching and Resource Center)	
ICE-KSCE Master's Thesis Award	July 2021
🍯 Institution of Civil Engineers (UK) & Korean Society of Civil Engineers	
Best Student Paper Award at ISRS2021	May 2021
Korean Society of Remote Sensing and Gaia3D	
Environmental Geospatial Data Idea Contest (Excellence Award)	Nov 2020
` Ministry of Environment, South Korea	
SPINS Lab (Outstanding Research Award)	Mar 2020
Seoul National University	
Student Competition using Meteorological Satellites (Research Award)	Jan 2019
` Korean Meteorological Administration	

SCHOLARSHIPS

Beatrix C. Farrand Memorial Fellowship for Research <i>UC Berkeley (Dept. of Landscape Architecture & Environmental Planning)</i>	May 2024
Beatrix C. Farrand Memorial Fellowship for Conference Travel <i>UC Berkeley (Dept. of Landscape Architecture & Environmental Planning)</i>	May 2023
Robert N. Colwell Memorial Fellowship	Feb 2023
`` The American Society for Photogrammetry and Remote Sensing	
Brain Korea 21 Plus Scholarship	2019 - 2021
Solutional Research Foundation of Korea	
Merit-based Scholarship	2014 – 2017, 2019
Seoul National University	
National Scholarship for Science and Engineering	2013 - 2014
ö Korea Student Aid Foundation	
SNU Global Scholarship	2012 - 2013
Seoul National University	

Aug 2016 – Feb 2017

Seoul National University

Sep 2011 - Jan 2012

London, Canada

PUBLICATIONS

* indicates equal contribution

Preprints & Working Papers

- [W5] Minho Kim, Adrienne Dodd, John Radke, G. Mathias Kondolf. "Multi-criteria decision-making for cascading hazards: Case study of post-fire debris flows".
- [W4] Minho Kim, Tomàs Artés, Laia Estivill, Pau Guarque, Marta C. González, Marc Castellnou. "Next-generation wildfire risk management using deep learning embeddings and similarity search"
- [W3] Minho Kim, Harrison Raine, John Radke, Marta C. González. "Rethinking Defensible Space: Spatial Responsibility for Wildfire Risk Mitigation in the Wildland Urban Interface. (To be submitted to Landscape and Urban Planning"
- [W2] Minho Kim, Marc Castellnou, Marta C. González. "Modeling Fire Potential Networks for Suppression Strategies." (Under Review in International Journal of Disaster Risk Reduction)
- [W1] Cristobal Pais, Minho Kim, Yanyan Xu, John Radke, Marta C. González. "An interdisciplinary datascience approach to managing natural hazards risk. arXiv:2407.07270."

Peer Reviewed Journal Papers

- [P6] Minho Kim, Cristobal Pais, Marta C. González. (2025). "Fire Spread Simulations Using Cell2Fire on Synthetic and Real Landscapes", Scientific Reports.
- [P5] Xihan Yao, Minho Kim, Iryna Dronova, Joe McBride, G. Mathias Kondolf, John Radke. (2025). "Community-scale microclimate simulation using Airborne Laser Scanning and object-based urban tree classification", Landscape and Urban Planning, 263, (105420).
- [P4] Minho Kim, Jeong, D. & Kim, Y. (2021). "Local climate zone classification using a multi-scale, multilevel attention network", ISPRS Journal of Photogrammetry and Remote Sensing, 181, (345-366).
- [P3] Minho Kim, Song, H. & Kim, Y. (2020). "Direct short-term forecast of photovoltaic power through a comparative study between COMS and Himawari-8 meteorological satellite images in a deep neural network", *Remote Sensing*, 12(15), (2357).
- [P2] Minho Kim, Jung, M. & Kim, Y. (2019). "Histogram matching of Sentinel-2 spectral information to enhance Planetscope imagery for effective wildfire damage assessment", Korean Journal of Remote Sensing, 35(4), (517-534).
- [P1] Kim, Y., Minho Kim, Choi, J. & Kim, Y. (2017). "Image fusion of spectrally nonoverlapping imagery using SPCA and MTF-based filters", *IEEE Geoscience and Remote Sensing Letters*, 14(12), (2295-2299).

Conference & Workshop Papers

- [C11] Yao, X. & Minho Kim. (2023). "A Lidar-based Method for 3D Urban Forest Evaluation and Microclimate Assessment, a Case Study in Portland, Oregon, USA", Accepted in AGU23. American Geophysical Union. Dec 11-25, 2023.
- [C10] Minho Kim, Dronova, I. & Radke, J. (2023). "Semantic Segmentation of Enhanced Landform Maps Using High Resolution Satellite Images", Accepted in IGARSS 2023 IEEE International Geoscience and Remote Sensing Symposium. IEEE. Pasadena, California, US., July 16-21, 2023. (*Attended as Session Chair)
- [C9] Yao, X. & Minho Kim (2023). "Exploratory remote sensing data analysis and clustering of urban vegetation and land surface temperature in Portland, Oregon", Accepted in IGARSS 2023 IEEE International Geoscience and Remote Sensing Symposium. IEEE. Pasadena, California, US., July 16-21, 2023.
- [C8] Minho Kim, Kwak, T., Jung, J. & Kim, Y. (2021). "Mapping inaccessible areas using deep learning based semantic segmentation of VHR satellite images with OpenStreetMap data", In Proceedings of the 2021 International Symposium of Remote Sensing, Virtual, May 26-28, 2021. (*Awarded Best Student Paper)
- [C7] Minho Kim, Jeong, D., Choi, H. & Kim, Y. (2020). "Developing High Quality Training Samples for Deep Learning Based Local Climate Zone Classification in Korea", arXiv preprint, Presented at AI for Earth Sciences Workshop at NeurIPS 2020, Virtual, arXiv:2011.01436.

- [C6] Minho Kim, Cho, K., Kim, H. & Kim, Y. (2020). "Fusion of High Resolution Land Surface Temperature Using Thermal Sharpened Images from Regression-based Urban Indices", ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences, 3, (pp247-254).
- [C5] Song, A., Kim, C., Minho Kim & Kim, Y. (2019). "Analysis of Geospatial Technology for Smart City Development: Case Study of South Korea", In Proceedings of The 1st Tunisian Smart Cities Symposium, Tunisia, 2019.
- [C4] Kim, G., Song, H., Kim, Minho Kim & Kim, Y. (2019). "Multimodal Merging of Satellite Imagery with Meteorological and Power Plant Data in Deep Convolutional Neural Network for Short-Term Solar Energy Prediction", In Proceedings of the 40th Asian Conference on Remote Sensing, Daejeon, South Korea, Oct 14-18, 2019.
- [C3] Minho Kim & Kim, Y. (2019). "Integration of Sentinel-2 Spectral Information with High Spatial Resolution Planetscope Imagery for Wildfire Damage Assessment", In Proceedings of the 40th Asian Conference on Remote Sensing, Daejeon, South Korea, Oct 14-18, 2019.
- [C2] Song, H., Kim, G., Minho Kim & Kim, Y. (2019). "Short-Term Forecasting of Photovoltaic Power Integrating Multi-Temporal Meteorological Satellite Imagery in Deep Neural Network", In 2019 IEEE PES Asia-Pacific Power and Energy Engineering Conference (APPEEC), Macao, (pp1-5).
- [C1] Minho Kim & Kim, Y. (2019). "Monitoring the Catastrophic 2018 Mendocino Complex Wildfire Using the Sentinel Constellation", In Proceedings of the 2019 International Symposium of Remote Sensing, Taiwan, April 14-17, 2019.

INVITED TALKS & PANELS

[T6]	"Shared responsibility and structure separation distance using network mod- eling and metrics"	
	Invited seminar for the Catalan Fire Service	Tl., 2024
	Invited seminar for the Pay Costa Foundation	July 2024
	Pau Costa Foundation	July 2024
[T5]	"Fire spread modeling and superpixel-based fire suppression networks" Invited seminar for the Meteorology and Air Quality group	·
	Wageningen University & Research	July 2024
	Invited seminar for the Catalan Fire Service	
	Forest Actions Reinforcement Group (GRAF), Firefighters Body, Catalan Government	July 2024
[T4]	"Data-driven planning and modeling for wildfire research using geospatial	
	data science and network science"	
	Guest lecture for CP4190 Introduction to Climate Change Planning	Eab 2024
[mol	Georgia Institute of Technology	Fed 2024
[13]	"Exploring Research in the Environmental Field"	
	Berkeley Environmental Economics and Policy Students	Oct 2021
[77.0]		Oct 2021
[12]	"Urban Remote Sensing"	
	Secul National University	Apr 2020
[TT1]	"Urban Demote Sensing"	npi 2020
[11]	Seminar for the Interdiscinlingry Program in Landscape Architecture	
	Seoul National University	Jan 2020

PATENTS & SOFTWARE

Song, H., Kim, Y., **Minho Kim**, Kim, K. Convolutional neural networks for short-term photovoltaic forecast using satellite imagery, meteorological data, and power station data. Patent, South Korea, 2021.

TEACHING

C Berkeley	
Lead Instructor (Course Link)	
• GEOG/LDARCH C188: Geographic Information Systems (<i>Lead Instructor</i>)	Fall 2022
- Teaching Effectiveness: $6.311/7$ from $61/169$ students (Dept. Average: $6.230/7)$	
Graduate Student Instructor	
• LDARCH/ESPM C289: Applied Remote Sensing	Spring 2024
• GEOG/LDARCH C188: Geographic Information Systems	Fall 2021
Seoul National University	
Teaching Assistant	
• 457.542*: Advanced Surveying (<i>Head TA</i>)	Spring 2021
• 457.205: Introduction to Geospatial Engineering (Lab Tutor & Head TA)	Spring 2021
\bullet 457.539*: Advanced Remote Sensing: VHR Imagery (Head TA)	Fall 2020
• 457.402: Remote Sensing (Lab Tutor & Head TA)	Fall 2020
• 457.544*: Satellite Image Interpretation (<i>Head TA</i>)	Spring 2020
• Leadership for Civil Engineers (TA)	Spring 2020
• 457.205: Spatial Informatics and Systems (Lab Tutor & Head TA)	Spring 2020
*Graduate-level Courses	
Mentored Students at UC Berkeley	
• Stella Wing (BS Conservation and Resource Studies & Data Science)	Sep 2023 – May 2024
Current: MESM @ UCSB	
• Harrison Raine (MLA & MCP)	Sep 2023 – July 2024
Current: NASA	
• Zeff Fengze Lin (Visiting student from South China University of Technology)	Jan 2023 – May 2023
Current: Ph.D. @ Tsinghua U	
• Weixin Li (MS Civil & Environmental Engineering)	Sep 2022 – May 2023
Current: Ph.D. @ UCSB	
• Xihan Yao (MLA)	Sep 2022 – May 2023
Current: Ph.D. @ UT Austin	
• Madison Chi (BS Environmental Science & Sustainable Design)	Sep 2022 – May 2023
Current: MPH @ UCLA	
Mentored Students at Seoul National University	
• Hyoungwoo Choi (BS Civil and Environmental Engineering)	Sep 2020 – Feb 2021

SERVICES

Reviewer (Total: 47 reviews)

Agronomy (3), Applied sciences (2), European journal of remote sensing (1), Fire (2), Forecasting (3), Geospatial information science (2), Geocarto international (1), GIScience & remote sensing (3), IEEE JSTARS (1), International journal of Digital Earth (2), ISPRS international journal of geo-information (2), Land (1), Remote sensing (22), Sustainability (2)

${\bf Membership}$

• International Association of Wildland Fire	2025
• Association of Environmental Professionals	2024
• IEEE Geoscience and Remote Sensing Society	2023
• American Society for Photogrammetry and Remote Sensing	2022
• Korean-American Scientists and Engineers Association	2022
• Korean Graduate Student Association	2021
• International Society for Photogrammetry and Remote Sensing Student Consortium	2020
• Korean Society of Civil Engineers	2019

Sep 2022 - Dec 2022

May 2017 – Jan 2019

Mar 2016 – June 2016

July 2023 Session Chair (Image Analysis for Land Cover Mapping), IGARSS 2023

Geospatial Data Consultant, Investigative Reporting Program

- Developed and managed multi-modal geospatial data (multispectral satellite images, nighttime light images, vector data related to census, parcels, etc.) to map deforestation and human activity in Brazil using Google Earth Engine (geemap & Javascript) and QGIS for J298 OSINT Seminar in the School of Journalism at UC Berkeley.
- Provided workshops and advised journalists on GIS and geospatial tools.

Ammunition Inspector, Republic of Korea Army

• Recorded ammunition transactions and composed ammunition inventory reports. After working hours, contributed to write-up on pan-sharpening image fusion research using Worldview images [P1].

General Education Peer Tutor, Seoul National University

• Tutored college-level English to undergraduate students for incoming freshmen

Section Editor, The SNU Quill - SNU's English Press

Sep 2013 – June 2015 • SNU campus news section reporter and editor for 9 volumes; responsible for 6-8 journal reporters. Also coordinated English writing/composition workshops and orientations.

PROJECTS

Roles: 🗊 GSR/RA | 🖍 Grant Writing | 🌡 Project Manager

Awarded Projects

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• ·	Multi-scale mitigation of wildfire risk vulnerabilities in the natural and built environments (College of Environmental Design, UC Barkelay)	\$35,000	2025-2026
_ _	Regional Sediment Bulking Methods for California in Support of Post Wild- fire Flood Mitigation (California Department of Transportation)	\$400,000	2022-2024
₽ V	Multiscale analysis for Improved Risk Assessment of Wildfires facilitated by Data and Computation (C3.ai)	\$200,000	2021-2022
£ 〕 ∕` ≞	Deep Learning Framework for Mapping Basic Spatial Data in North Ko- rea Using Very High Resolution Satellite Imagery (Institute for Peace and Unification)	\$28,000	2021-2022
_ _	Development of Disaster Analysis Technology Using High-Resolution Satel- lite Imagery (Ministry of the Interior)	\$300,000	2019-2022
₽ /	Forecasting Photovoltaic Power using Meteorological Satellite Imagery and Deep Learning (SK Telecom)	\$60,000	2019
Submitted	Projects		
🖬 🖍	Resilient Engineering and Knowledge Integration for Networked Disaster- adaptive Lifelines and Convergent Ecosystems (REKINDLE) (NSF)	\$2,500,000)
.		\$100 000	

Multi-scale mitigation of wildfire risk vulnerabilities in the natural and \$100,000 Shortlisted built environments (CalFire)

SKILLS

GitHub Coding	https://github.com/minhokim93 Python, C/C++, CMake, Matlab, Javascript (Google Earth Engine), Git, Scripting (Bash), LaTeX, HTML
\mathbf{ML}/\mathbf{DL}	Tensorflow, Keras, PyTorch, Scikit-learn, Scikit-image, OpenCV
Remote Sensing	ENVI (SARscape), Google Earth Engine (Javascript/geemap), Python (Rasterio/GDAL)
GIS	ArcGIS, QGIS, Python
Languages	English (Native), Korean (Native), French (Fluent)

Certification

• Applied Data Science	Expected
• Teaching and Learning in Higher Education	Expected
• Geospatial Information Science and Technology	2022

References

Dr. Prof. Marta C. González

Department of Civil and Environmental Engineering Department of City and Regional Planning University of California, Berkeley 406C Wurster Hall Email: martag@berkeley.edu

Dr. Prof. John Radke

Department of Landscape Architecture and Environmental Planning Department of City and Regional Planning University of California, Berkeley 412 Wurster Hall #2000 Email: ratt@berkeley.edu

Dr. Prof. Yongil Kim

Department of Civil and Environmental Engineering Seoul National University Building 35, Room 410 1, Gwanak-ro, Gwanak-gu, Seoul, 08826 E-mail: yik@snu.ac.kr Tel: +82-2-880-7364