




MINHO KIM

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 Scholar |  ResearchGate |  Twitter |  ORCID






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

-  **University of California, Berkeley** Sep 2021 – Present
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 Hsiang](#)
-  **Seoul National University** Mar 2017 – Feb 2021
M.S. Civil & Environmental Engineering
Thesis: [Local Climate Zone Classification Using Multi-Scale Convolutional Networks](#)
Advisor: [Yongil Kim](#)
-  **Seoul National University** Sep 2012 – Feb 2017
B.S. Civil & Environmental Engineering
Thesis: Monitoring North Korea's 4th Nuclear Test Site with Sentinel-1A Data Using DInSAR
Advisor: [Yongil Kim](#)

RESEARCH EXPERIENCE

-  **Researcher (Center for Catastrophic Risk Management)** Jan 2025 – Present
 - System-level governance frameworks for catastrophic risk management
 - Reviewed natural hazard modeling and data sources for catastrophic wildfire events
-  **Visiting Researcher (Catalan Fire Service)** July 2024 – Sep 2024
Advisor: Marc Castellnou *Barcelona, Spain*
 - Modeled fire potential polygons and networks using simulations and hydrology-inspired tools for fire suppression decision support [W2]
 - Improved existing WUI maps using automatic structural separation distance and permeability metrics
 - Measured shared responsibility metrics in WUI map areas in Catalonia [W3]
-  **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 [W5]
 - 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)** Jan 2022 – present
Advisor: Marta C. González, Mentor: Cristobal Pais *UC Berkeley*
 - Generated physics-based, semi-empirical data computed in *R* to integrate into a cellular automata simulator (*C++*) to conduct fire spread simulations [P6].
 - High resolution mapping of fuels and vegetation using deep learning [C10].
-  **Research Assistant (SPINS-RS Lab)** Mar 2019 – Feb 2021
Advisor: Yongil Kim *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].

- 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)

Aug 2016 – Feb 2017

Advisor: [Yongil Kim](#)

Seoul National University

- 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)

Sep 2011 – Jan 2012

Advisor: [Jeffrey Carson](#)

London, Canada

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

WORK EXPERIENCE

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 deep learning with very high resolution satellite imagery [C8].

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

🏆 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

AEP Student Scholarship

July 2025

🏆 Association of Environmental Professionals (AEP)

Beatrix C. Farrand Memorial Fellowship for Research

May 2024

🏆 UC Berkeley (Dept. of Landscape Architecture & Environmental Planning)

Beatrix C. Farrand Memorial Fellowship for Conference Travel

May 2023

🏆 UC Berkeley (Dept. of Landscape Architecture & Environmental Planning)

Robert N. Colwell Memorial Fellowship

Feb 2023

🏆 The American Society for Photogrammetry and Remote Sensing

Brain Korea 21 Plus Scholarship

2019 – 2021

🏆 National Research Foundation of Korea

Merit-based Scholarship

2014–2017, 2019

🏆 Seoul National University

National Scholarship for Science and Engineering

2013 – 2014

🏆 Korea Student Aid Foundation

SNU Global Scholarship

2012 – 2013

🏆 Seoul National University

PUBLICATIONS

* Equal contribution, † Corresponding author

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 in Northern California”.
- [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*) ([Pre-print](#))
- [W1] Cristobal Pais, **Minho Kim**, Yanyan Xu, John Radke, Marta C. González. “[An interdisciplinary data-science 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*, 15 25173 (2025).
- [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, multi-level 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

- [C14] **Minho Kim**, Dodd, A., Radke J., Ulyashin V., Serra-Llobet, A., Falzone, A. & Kondolf, M. (2025). “Flood after Fires: A Scalable Decision-Support Framework for Post-Fire Debris Flow Risk”, *Submitted to AGU 2025. New Orleans, USA. Dec 15-19, 2025*.
- [C13] **Minho Kim**, Pais, C., & Gonzalez, M.C. (2025). “Fire spread simulations using Cell2Fire on synthetic and real landscapes”, *Submitted to International Fire Ecology and Management Congress. Association for Fire Ecology. New Orleans, USA. Dec 2-6, 2025*.
- [C12] **Minho Kim**, Castellnou, M. & Gonzalez, M.C. (2025). “Modeling fire potential networks for suppression strategies”, *Accepted in Conference of Complexity Sciences 2025 (Complex Systems, Data Analytics, and Human Behavior). Siena, Italy. Sep 2-5, 2025*.
- [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 modeling and metrics”**
Invited seminar for the Catalan Fire Service
 Forest Actions Reinforcement Group (GRAF), Catalan Government **July 2024**
Invited seminar for the Pau Costa Foundation
 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
 Georgia Institute of Technology **Feb 2024**
- [T3] **“Exploring Research in the Environmental Field”**
Berkeley Environmental Economics and Policy Students
 UC Berkeley **Oct 2021**
- [T2] **“Urban Remote Sensing”**
Guest lecture for graduate course 457.544: Satellite Image Interpretation
 Seoul National University **Apr 2020**
- [T1] **“Urban Remote Sensing”**
Seminar for the Interdisciplinary 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

UC Berkeley

Lead Instructor ([Course Link](#))

- GEOG/LDARCH C188: Geographic Information Systems (*Lead Instructor*) 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 (*Head TA*) Spring 2021
- 457.205: Introduction to Geospatial Engineering (*Lab Tutor & Head TA*) Spring 2021
- 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 (*Head TA*) 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: 48 reviews)

Agronomy (3), Applied sciences (2), European journal of remote sensing (1), Fire (2), Forecasting (3), Geo-spatial 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 (2), Remote sensing (22), Sustainability (2)

Membership

- Association for Fire Ecology 2025
- American Geophysical Union 2025
- 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**

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

Geospatial Data Consultant, Investigative Reporting Program **Sep 2022 – Dec 2022**

- 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 **May 2017 – Jan 2019**

- 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 **Mar 2016 – June 2016**

- 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

 	Multi-scale mitigation of wildfire risk vulnerabilities in the natural and built environments (College of Environmental Design, UC Berkeley)	\$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
 	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 Korea Using Very High Resolution Satellite Imagery (Institute for Peace and Unification)	\$28,000	2021-2022
	Development of Disaster Analysis Technology Using High-Resolution Satellite 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	
 	Multi-scale mitigation of wildfire risk vulnerabilities in the natural and built environments (CalFire)	\$100,000	Shortlisted

SKILLS

GitHub	https://github.com/minhokim93
Coding	Python, C/C++, CMake, Matlab, Javascript (Google Earth Engine), Git, Scripting (Bash), LaTeX, HTML
ML/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
- Teaching and Learning in Higher Education
- Geospatial Information Science and Technology

Expected
Expected
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

Marc R. Castellnou

Incident Commander and Lead of Forest Actions Reinforcement Group (GRAF)
Catalan Fire Service
Avinguda de Serra Galliners, 112, 08290, Cerdanyola del Vallès, Spain
Email: incendi@yahoo.com