

# MINHO KIM

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 Scholar |  ResearchGate |  Twitter |  ORCID




## RESEARCH INTERESTS

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- **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

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-  **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

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-  **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

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\* 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

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- [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), Catalan Government **July 2024**
- [T4] **“Data-driven planning and modeling for wildfire research using geospatial data science and network science”**  
*Invited seminar for the Ecological Sensing Lab*  
 Seoul National University **Aug 2025**  
*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

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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

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### 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

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\*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

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### 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  | <b>2025-2026</b> |
|    | Regional Sediment Bulking Methods for California in Support of Post Wild-fire Flood Mitigation (California Department of Transportation)                 | \$400,000 | <b>2022-2024</b> |
|     | Multiscale analysis for Improved Risk Assessment of Wildfires facilitated by Data and Computation (C3.ai)  | \$200,000 | <b>2021-2022</b> |
|    | Deep Learning Framework for Mapping Basic Spatial Data in North Korea Using Very High Resolution Satellite Imagery (Institute for Peace and Unification) | \$28,000  | <b>2021-2022</b> |
|    | Development of Disaster Analysis Technology Using High-Resolution Satellite Imagery (Ministry of the Interior)   | \$300,000 | <b>2019-2022</b> |
|     | Forecasting Photovoltaic Power using Meteorological Satellite Imagery and Deep Learning (SK Telecom)   | \$60,000  | <b>2019</b>      |

### 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   | <b>Shortlisted</b> |

## SKILLS

|                       |  |
|-----------------------|--|
| <b>GitHub</b>         | <a href="https://github.com/minhokim93">https://github.com/minhokim93</a>                          |
| <b>Coding</b>         | Python, C/C++, CMake, Matlab, Javascript (Google Earth Engine), Git, Scripting (Bash), LaTeX, HTML |
| <b>ML/DL</b>          | Tensorflow, Keras, PyTorch, Scikit-learn, Scikit-image, OpenCV                                     |
| <b>Remote Sensing</b> | 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

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**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