






MINHO KIM

Ph.D. Student

Department of Landscape Architecture & Environmental Planning
University of California, Berkeley

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RESEARCH INTERESTS

Remote Sensing, Geospatial Data Science, Machine Learning, Computer Vision,
Environmental Planning, Sustainable Development, Fire Spread Modeling


EDUCATION

Ph.D. Landscape Architecture & Environmental Planning Sep 2021 – Present
 UNIVERSITY OF CALIFORNIA, BERKELEY Berkeley, CA

Topic: Towards Transformative Resilience in the WUI: Combining High Resolution
Remote Sensing and Machine Learning-based Fire Spread Simulations
Advisors: [Marta Gonzalez](#), [John Radke](#)

M.Sc. Civil & Environmental Engineering Mar 2017 – Feb 2021
 SEOUL NATIONAL UNIVERSITY Seoul, South Korea

Thesis: “Local Climate Zone Classification Using Multi-Scale Convolutional Networks” ([Link](#))
Advisor: [Yongil Kim](#)

B.Sc. Civil & Environmental Engineering Sep 2012 – Feb 2017
 SEOUL NATIONAL UNIVERSITY Seoul, South Korea

Thesis: “Study Analysis of North Korea’s 4th Nuclear Test Site with Sentinel-1A Data
Using DInSAR Techniques”
Advisor: [Yongil Kim](#)

WORK EXPERIENCE

Graduate Student Researcher Berkeley, CA
 *HumNet Lab, University of California, Berkeley* Jan 2022 – present

Advisor: [Marta Gonzalez](#) & Mentor: [Cristobal Pais](#)

- Data-driven, machine learning-based fire spread simulation using Cell2Fire (Working Paper [W1])
- High spatio-temporal resolution mapping of vegetation fuels and wildfire hazards in the landscape (Working Paper [W2])

Researcher Seoul, South Korea
 *Institute of Construction & Env. Eng., Seoul National University* Mar 2021 – Aug 2021

- Developed high resolution land cover maps of inaccessible areas using a deep learning-based semantic segmentation model and very high resolution satellite imagery.

PR Manager Seoul, South Korea
 *Education & Research Program: InfraSPHERE, Seoul National University* Mar 2021 – Aug 2021

- Helped promote and coordinate the BK21 Seminar Series (New Frontiers of InfraSPHERE). Also, designed the main website for BK Infrasphere (hosted by Dept. of Civil and Environmental Engineering) and maintained their Youtube channel.

Lab Manager Seoul, South Korea
 *SPINS-RS Lab, Seoul National University* Mar 2021 – Aug 2021

- Organized lab’s surveying equipment (GPS/GNSS, total stations, etc) and software licenses.

Research Assistant

Seoul, South Korea

📍 *SPINS-RS Lab, Seoul National University*

Mar 2019 – Feb 2021

Advisor: Yongil Kim

- **Urban Remote Sensing:** Generated high resolution Local Climate Zone classification maps of key cities in South Korea using newly developed multi-scale CNN models with multitemporal Sentinel-2 images and GIS data (national LULC maps and OpenStreetMap).
- **Multi-Disciplinary Research:** Conducted photovoltaic power forecasts of solar farms using large-scale, multitemporal geostationary satellite images and multi-source meteorological data via machine learning and CNN.
- **Data Fusion:** Developed a spatiotemporal fusion model to produce disaggregated Landsat-8 thermal images in heterogeneous urban areas.
- **Change Detection/Monitoring:** Applied radiometric calibration methods to help detect and monitor wildfire burn scars using change detection results from multitemporal Sentinel-2 and PlanetScope images.

Research Assistant (Undergraduate Intern)

Seoul, South Korea

📍 *SPINS-RS Lab, Seoul National University*

Aug 2016 – Feb 2017

Advisor: Yongil Kim

- Analyzed ground deformations in inaccessible, remote areas using Sentinel-1 SAR images.
- Prepared manuscript entitled “Case Study on the Feasibility of DInSAR Analysis with Sentinel-1 Data to Detect the Location of North Korea’s 4th Nuclear Test” for consideration in Remote Sensing.
- Carried out fieldwork and experiments using a ground-based hyperspectral imager to monitor crop health.

Research Assistant (Co-op student)

London, Canada

📍 *Carson Lab (Medical Imaging), Lawson Health Research Institute*

Sep 2011 – Jan 2012

Advisor: Jeffrey Carson

- Researched photoacoustic image reconstruction of a line source using multiple regularization percentages with the addition of maximum intensity projection using Matlab.

HONORS / AWARDS**ICE-KSCE Master’s Thesis Award**

July 2021

Institution of Civil Engineers & Korean Society of Civil Engineers🌟 Selected as best 2021 English Master’s thesis in civil engineering by ICE and KSCE. ([Link](#))**Best Student Paper Award**

May 2021

Korean Society of Remote Sensing and Gaia3D

🌟 Selected as best student paper award at the International Symposium of Remote Sensing 2021

Environmental Geospatial Data Idea Contest (Excellence Award)

Nov 2020

Ministry of Environment, South Korea

🌟 Local climate zone classification using multi-scale CNN for the development of LCZ and environmental big data.

SPINS Lab (Outstanding Research Award)

Mar 2020

*Seoul National University***Student Competition using Meteorological Satellites (Research Award)**

Jan 2019

Korean Meteorological Administration

🌟 Development and automation of a preprocessing algorithm for the harmonization of COMS and GEOKOMPSAT-2A satellite images.

SCHOLARSHIPS

Brain Korea 21 Plus Scholarship <i>National Research Foundation of Korea</i>	2019 – 2021
Merit-based Scholarship <i>Seoul National University</i>	2014 – 2017, 2019
National Scholarship for Science and Engineering <i>Korea Student Aid Foundation</i>	2013 – 2014
SNU Global Scholarship <i>Seoul National University</i>	2012 – 2013

PUBLICATIONS

**Papers reported in reverse chronological order*

Preprints & Working Papers

- [W1] **Minho Kim**, Cristobal Pais, John Radke, Marta Gonzalez. *Cell2FireML : Machine learning based fire spread simulator using BehavePlus and Cell2Fire.*
- [W2] **Minho Kim**, John Radke. *Enhanced lifeform classification using high resolution satellite images.*

Peer Reviewed Journal Papers

- [P1] **Minho Kim**, Jeong, D. & Kim, Y. *Local climate zone classification using a multi-scale, multi-level attention network*, ISPRS Journal of Photogrammetry and Remote Sensing, 181, (345-366).
- [P2] **Minho Kim**, Song, H. & Kim, Y. *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).
- [P3] **Minho Kim**, Jung, M. & Kim, Y. *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).
- [P4] Kim, Y., **Minho Kim**, Choi, J. & Kim, Y. *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

- [C1] **Minho Kim**, Kwak, T., Jung, J. & Kim, Y. *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.
- [C2] **Minho Kim**, Jeong, D., Choi, H. & Kim, Y. *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](https://arxiv.org/abs/2011.01436).
- [C3] Song, A., Kim, C., **Minho Kim** & Kim, Y. *Analysis of Geospatial Technology for Smart City Development: Case Study of South Korea*, In Proceedings of The 1st Tunisian Smart Cities Symposium, 2019.
- [C4] Kim, G., Song, H., Kim, **Minho Kim** & Kim, Y. *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.

- [C5] **Minho Kim** & Kim, Y. *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.
- [C6] Song, H., Kim, G., **Minho Kim** & Kim, Y. *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).
- [C7] **Minho Kim**, Cho, K., Kim, H. & Kim, Y. *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).

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

Lead Instructor(Course Link)

University of California, Berkeley

- GEOG188/LDARCH188: Geographic Information Systems (*Lead Instructor*) Sep 2022 – Dec 2022

Graduate Student Instructor

University of California, Berkeley

- GEOG188/LDARCH188: Geographic Information Systems (*Lab Tutor & GSI*) Sep 2021 – Dec 2021

Teaching Assistant

Seoul National University

- 457.542*: Advanced Surveying (*Head TA*) Mar 2021 – June 2021
- 457.205: Introduction to Geospatial Engineering (*Lab Tutor & Head TA*) Mar 2021 – June 2021
- 457.539*: Advanced Remote Sensing: VHR Imagery (*Head TA*) Sep 2020 – Dec 2020
- 457.402: Remote Sensing (*Lab Tutor & Head TA*) Sep 2020 – Dec 2020
- 457.544*: Satellite Image Interpretation (*Head TA*) Mar 2020 – June 2020
- Leadership for Civil Engineers (*TA*) Mar 2020 – June 2020
- 457.205: Spatial Informatics and Systems (*Lab Tutor & Head TA*) Mar 2020 – June 2020

*Graduate-level Courses

SERVICES

Reviewer

GISciences, Remote Sensing, Geo-Spatial Information Science, ISPRS International Journal of Geo-Information, Geocarto International, Applied Sciences, Sustainability, Agronomy, Forecasting

 **Publons/Web of Science**

Advisor/Mentor at UC Berkeley

- [Xihan Yao](#) (MLA Landscape Architecture & Environmental Planning) (Fall 2022 - Present)
 - [Madison Chi](#) (BS Environmental Science & Minor in Sustainable Design) (Fall 2022 - Present)
- *Through ESPM 175L

Geospatial Data Support for J298 OSINT Seminar

Berkeley, California

Investigative Reporting Program in the Graduate School of Journalism

Sep 2022 – Present

- Developed and managed geospatial data (multispectral satellite images, nighttime light images, vector data processing) related to deforestation and human activity in Brazil using Google Earth Engine and ArcGIS

Ammunition Inspector*Republic of Korea Army*

Pocheon, South Korea

May 2017 – Jan 2019

- Recorded ammunition transactions and composed ammunition inventory reports using Excel. After working hours, contributed to writeup on pan-sharpening image fusion research using Worldview images.

General Education Peer Tutor*Seoul National University*

Seoul, South Korea

Mar 2016 – June 2016

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

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

Seoul, South Korea

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.

SKILLS

GitHub<https://github.com/minhokim93>**Programming**

Python, Matlab, C++, R, LaTeX

Machine Learning

Tensorflow, Keras, Pytorch, Scikit-learn

Remote Sensing

ArcGIS, QGIS, ENVI (SARscape), Google Earth Engine (Javascript)

Fire Modeling

FARSITE/FLAMMAP

Languages

English, Korean, French

REFERENCES

Dr. Prof. John Radke

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University of California, Berkeley

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Dr. Prof. Marta Gonzalez

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406C Wurster Hall

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Dr. Prof. Yongil Kim

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Seoul National University

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