MINHO KIM

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EDUCATION

M.S. | Seoul National University, Civil and Environmental Engineering *(Expected)* **Seoul, Korea**
Advisor: Prof. Yongil Kim *Mar 2019 – Feb 2021*
Thesis: Local Climate Zone Classification Using Multi-Scale Convolutional Networks
*Relevant Coursework (*Overall GPA: 4.24/4.3*)

- Advanced Surveying
- Advanced Geographic Information Systems
- Seminar in Remote Sensing (Urban Remote Sensing)
- Process and Imaging of Earth System Remote Sensing Data
- Advanced Remote Sensing (High-res. Satellite Image Analysis)
- Green Infrastructure in Smart Cities

B.S. | Seoul National University, Civil and Environmental Engineering **Seoul, Korea**
Thesis: Analysis of North Korea's 4th Nuclear Test Site Location with Sentinel-1A Data Using DInSAR Techniques *Sep 2012 – Feb 2017*
*Relevant Coursework:

- Spatial Informatics and Systems
- Spatial Information System
- Remote Sensing
- Urban Planning
- Advanced Remote Sensing (Application on KOMPSAT Imagery)
- Statistics & Statistics Lab
- Engineering Mathematics

RESEARCH EXPERIENCE

Research Assistant **Seoul, Korea**
Seoul National University – SPINS-RS Lab *Feb 2019 – Present*

- **Urban Remote Sensing:** Developed multi-scale CNN models for Local Climate Zone classification of key cities in South Korea using multi-temporal Sentinel-2 images with GIS data (OpenStreetMap, LULC map data)
- **Multi-Disciplinary Research:** Forecasted photovoltaic power from solar farms using large-scale, multitemporal geostationary satellite images and multi-source meteorological data via machine learning and CNN-based models
- **Data Fusion:** Disaggregation & spatiotemporal fusion of 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 multi-temporal Sentinel-2 and PlanetScope images
- **Multi-Modal/Sensor Experience:** Multi-modal image processing including, but not limited to: SAR, very-high resolution, mid-high resolution, geostationary, nighttime, CubeSat.

Funding Entity	Period	Research Project
Ministry of Interior & Safety (Korea)	*July 2019 – Present*	Detection and Monitoring of Natural Disasters Using Multi-Modal and Multi-Sensor Remotely-Sensed Imagery
National Research Foundation (Korea)	*July 2019 – Present*	Development of an End-to-End Deep Learning based Technique to Generate Very High Resolution Environmental Data
National Geographic Information Institute (Korea)	*Aug 2019 – July 2020*	Establishment of Spatial Information Roadmap for Supporting the Infrastructure Construction of the Unified Korean Peninsula
SK Telecom	*July 2019 – Dec 2019*	Solar Power Prediction using Geostationary Satellite Imagery via Deep Learning Forecast Models

Research Assistant (Undergraduate Intern) **Seoul, Korea**
Seoul National University – SPINS-RS Lab *Aug 2016 – Feb 2017*

- 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

WORK EXPERIENCE

Teaching Assistant **Seoul, Korea**
Seoul National University *Mar 2020 – Dec 2020*

- Graduate courses: Satellite Image Interpretation, Advanced Remote Sensing (KOMPSAT VHR imagery)
- Undergraduate courses: Leadership for Civil Engineers, Spatial Informatics and Systems, Remote Sensing

Workshop Presenter (Invited Talk) **Seoul, Korea**
Seoul National University – SPINS-RS Lab *Jan 2020*

- Provided seminar on urban remote sensing at a workshop hosted by the Dept. of Landscape Architecture.

Ammunition Inspector **Pocheon, Korea**
Republic of Korea Army (Mandatory 2-Year Service) *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, Korea**
Seoul National University *Mar 2016 – June 2016*

- Tutored college-level English to undergraduate students and acted as mentor for incoming freshmen

Section Editor **Seoul, Korea**
The SNU Quill – School's English Press at snuquill.com *Sep 2013 – June 2015*
- SNU campus news section reporter and editor for 9 volumes; responsible for 6-8 journal reporters
- Coordinated English writing/composition workshops and orientations

Research Assistant (Co-op student) **London, Canada**
Lawson Health Research Institute (Medical Imaging) *Sep 2011 – Jan 2012*
- Researched on photoacoustic image reconstruction of a line source using multiple regularization percentages with the addition of maximum intensity projection using Matlab

PUBLICATIONS

Peer-Reviewed Journal Articles

1. **Minho Kim**, H. Song, Y. Kim **(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.*
2. **Minho Kim**, M. Jung, Y. Kim **(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.
3. Y. Kim, **Minho Kim**, J. Choi, Y. Kim **(2017)**. Image fusion of spectrally nonoverlapping imagery using SPCA and MTF-based filters. *IEEE Geoscience and Remote Sensing Letters*, 14(12), 2295-2299.

Conference Proceedings

1. **Minho Kim**, K. Cho, H. Kim, Y, Kim **(2020).** Spatiotemporal 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, XXIV ISPRS Congress 2020.*
2. A. Song, **Minho Kim**, Y. Kim, C. Kim **(2019).** Analysis of geospatial technology for smart city development: Case study of South Korea. *1st Tunisian Smart Cities Symposium 2019*, Tunis, Tunisia, Nov 19.
3. H. Song, G. Kim, **Minho Kim**, Y. Kim **(2019)**. Short-term forecasting of photovoltaic power integrating multi-temporal meteorological satellite imagery in deep neural network. *IEEE PES Asia-Pacific Power and Energy Engineering Conference 2019*, Macao, China, Dec 1-4. *(Oral Presenter)*
4. **Minho Kim** & Y. Kim **(2019).** Integration of Sentinel-2 spectral information with high spatial resolution PlanetScope imagery for wildfire damage assessment. *Asian Conference on Remote Sensing 2019*, Daejeon, Korea, Oct 14-18.
5. G. Kim, H. Song, **Minho Kim**, Y. Kim **(2019)**. Multimodal merging of satellite imagery with meteorological and power plant data in deep convolutional neural network for short-term solar energy prediction. *Asian Conference on Remote Sensing 2019*, Daejeon, Korea, Oct 14-18.
6. **Minho Kim** and Y. Kim **(2019)**. Monitoring the catastrophic 2018 Mendocino complex wildfire using the Sentinel constellation. *International Symposium on Remote Sensing 2019,* Taipei, Taiwan, April 17-19.

Workshop Presentations

1. **Minho Kim**, D. Jeong, H. Choi Y, Kim **(2020).** Developing High Quality Training Samples for Deep Learning Based Local Climate Classification in Korea. *AI for Earth Sciences Workshop at NeurIPS2020,* Dec. 12. (*Accepted*)

AWARDS

- **Research Award**, Development and automation of a preprocessing algorithm for the harmonization of COMS and GEOKOMPSAT-2A satellite images. *Student Research Competition using Meteorological Satellites, Korea Meteorological Administration (2019)*
- **Excellence Award,** Local climate zone classification using multi-scale CNN for the development of LCZ and environmental big data. *Environmental Geospatial Data Idea Contest, Ministry of Environment (2020)*
- **Outstanding Research Award.** *Spatial Informatics Lab at Seoul National University (2020)*

SCHOLARSHIPS

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

SKILLS, ACTIVITIES, INTERESTS

- **Languages**: English (native), Korean (native), French (fluent), Spanish (elementary)
- **Technical Skills**:
  - Main programming skills: Python, Matlab
  - Python libraries: NumPy, Matplotlib, Pandas, Scikit-learn, Tensorflow, Keras
  - Image processing & GIS software: ArcGIS, ENVI (SARscape), SNAP, QGIS, Google Earth Engine
- **Interests**: Professional writing, travelling, photography, ice hockey