

Curriculum Vitae

February, 2025

Jaese Lee

wotp12@unist.ac.kr / wotp12@gmail.com

UNIST-gil 50, Ulsan 44919, South Korea

Education

Mar.2019 –Mid 2025 (Expected)

Ulsan National Institute of Science and Technology (UNIST), Ulsan, Korea

Combined Master's-Doctoral Course, Major: Environmental Science and Engineering, GPA: 3.86/4.3

Mar.2016 – Aug.2018 (transferred to)

Kyungpook National University (KNU), Daegu, Korea

B.A., Major: Geography, GPA: 3.84/4.5

Mar.2012 – Mar.2016 (transferred from)

Yeungnam University (YU), Gyeongsan, Korea

B.A., Major: Sociology, GPA: 3.68/4.5

Research interests

1. Understanding Earth's eco-hydrological environment using remote sensing data
2. Retrieval of geophysical parameter based on radiative transfer model and deep learning
3. Soil moisture control on land carbon uptake variability

Publications

1. **Lee, J.**, Colliander, A., & Im, J. (Submitted). SMAP L-band-like Soil Moisture and Vegetation Optical Depth Retrieved from C-band Soil Moisture. *Geophysical Research Letters*.
2. Jung, S., Kim, S., Jang, E., **Lee, J.**, Han, D., & Im, J. (Under review). Improving timeliness and accuracy of daily gap-free satellite sea surface salinity using a self-supervised deep neural network. *IEEE Transactions on Geoscience and Remote Sensing*.
3. Kang, Y., **Lee, J.**, & Im, J. (In revision). Comprehensive global fire radiative power evaluation by minimizing detection bias with triple collocation analysis. *Remote Sensing of Environment*.
4. **Lee, J.**, Im, J., Son, B., Cosio, E. G., & Salinas, N. (2024). Improved SMAP Soil Moisture Retrieval Using a Deep Neural Network-based Replacement of Radiative Transfer and Roughness Model. *IEEE*

Transactions on Geoscience and Remote Sensing.

5. **Lee, J.**, Jung, S., & Im, J. (2024). ASCAT2SMAP: image-to-image translation to obtain L-band-like soil moisture from C-band satellite data. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*.
6. **Lee, J.**, Park, S., Im, J., Yoo, C., & Seo, E. (2022). Improved soil moisture estimation: Synergistic use of satellite observations and land surface models over CONUS based on machine learning. *Journal of Hydrology*, 609, 127749.
7. Park, S., **Lee, J.**, Yeom, J., Seo, E., & Im, J. (2022). Performance of drought indices in assessing rice yield in North Korea and South Korea under the different agricultural systems. *Remote Sensing*, 14(23), 6161.
8. Cho, D., Yoo, C., Im, J., Lee, Y., & **Lee, J.** (2020). Improvement of spatial interpolation accuracy of daily maximum air temperature in urban areas using a stacking ensemble technique. *GIScience & Remote Sensing*, 57(5), 633-649.
9. **Lee, J.**, Kim, W., Im, J., Kwon, C., & Kim, S. (2021). Detection of forest fire damage from Sentinel-1 SAR data through the synergistic use of principal component analysis and K-means clustering [Sentinel-1 SAR K-means clustering].
10. **Lee, J.**, Kang, Y., Son, B., Im, J., & Jang, K. (2021). Estimation of Leaf Area Index Based on Machine Learning/PROSAIL Using Optical Satellite Imagery. *Korean Journal of Remote Sensing*, 37(6_1), 1719–1729.
11. Son, B., Im, J., Park, S., & **Lee, J.** (2021). Satellite-based Drought Forecasting: Research Trends, Challenges, and Future Directions. *Korean Journal of Remote Sensing*, 37(4), 815-831.
12. Sim, S., Kim, W., **Lee, J.**, Kang, Y., Im, J., Kwon, C., & Kim, S. (2020). Wildfire severity mapping using sentinel satellite data based on machine learning approaches. *Korean Journal of Remote Sensing*, 36(5_3), 1109-1123.
13. Park, S., Son, B., Im, J., **Lee, J.**, Lee, B., & Kwon, C. (2019). Development of satellite-based drought indices for assessing wildfire risk. *Korean Journal of Remote Sensing*, 35(6_3), 1285-1298.

Grants and awards

1. Grant for Ph.D. fellowship from National Research Foundation of South Korea (Sep, 2023). Title: An Improved Parameterization of Passive Microwave Radiative Transfer Model using a Physics Informed Neural Network.
2. Excellent paper award from The Korean Association of Geographic Information Studies (Nov, 2019)

International presentations

1. **Lee, J.**, Im, J., & Son, B. (2024). A Physics-Informed Neural Network-based Retrieval of L-band Tau-Omega Model parameters for Improved Soil Moisture Retrieval. AGU24. (Poster)
2. **Lee, J.**, Im, J., & Son, B. (2023). A Deep learning-based replacement of Tau-Omega Model for Improved Soil Moisture Retrieval. AGU23. (Poster)
3. **Lee, J.**, Im, J., & Son, B. (2022). An Improved SMAP Soil Moisture Retrieval using Deep Neural Network-based inversion of a Passive Microwave Radiative Transfer Model. AGU22. (Poster)
4. **Lee, J.**, Park, S., Im, J., Yoo, C. (2019). Remote sensing based soil moisture downscaling using

weighted composite of CCI and GLDAS soil moisture using random forest. ACRS2019 (Oral)

Applicable data and skills

Data types and skills	Details
Satellite data	SMAP, ASCAT, SMOS, AMSR-E/2 ALOS2 PALSAR2, Sentinel-1 Sentinel-2, Landsat, MODIS
Numerical model data	GLDAS, NLDAS, ERA5
Ground measurement data	ISMN, SMAP CVS
Physically-based modeling	Tau-Omega model, Q/H roughness model, Mironov model Oh model, Dubois model, Water cloud model
Deep Learning Technique	Neural Networks (Physics-Informed, Convolutional, Feed-forward, Autoencoder...), Random Forest, Support Vector Machine
Program language	Python, Matlab, R
Visualization tool	ArcGIS Pro, ArcGIS, Qgis, Erdas Imagine
Writing tool	LaTeX, MS Word
Language	Korean, English, Japanese
Homepage	https://jaeselee.github.io/