Falu Hong

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Short Biography

Falu Hong is a Ph.D. candidate in the Department of Natural Resource and the Environment at University of Connecticut (UConn) working with Dr. Zhe Zhu. He has a strong background in remote sensing with interdisciplinary knowledge from geography and ecology science. He focuses on using Landsat time-series and machine learning models to map land cover and land use, detect and simulate land change, such as deforestation and urbanization, and evaluate its impact on biodiversity. Before working at UConn, Falu majored in the theory and application of thermal remote sensing, with more attention to the diurnal and annual land surface temperature dynamics.

Education

09/2020 - present	**University of Connecticut, Connecticut, U.S.A.**
	Ph.D. in Natural Resources: Land, Water, and Air
	Dissertation: *Remote Sensing the Human Footprint: Mapping impervious Surface Dynamics, Primary Forest Loss, and Biodiversity Extinction Risk*
	Advisor: Zhe Zhu
09/2017 – 07/2020	**Nanjing University, China**
	Master in Cartography and Geographic Information System
	Advisor: Wenfeng Zhan
09/2013 – 07/2017	**Nanjing University, China**
	Bachelor in Geographic Information Science

Research Interests

Remote sensing, land cover and land use change, land change simulation, deforestation, biodiversity, urbanization, impervious surface, machine learning, urban heat island, land surface temperature

Research Experiences

Decoding primary forest (PF) change in Haiti and the Dominican Republic
Supervised independent research 01/2022 – 2024-06
- Use all available Landsat data and COLD (COtinous Monitoring of Land Disturbance) algorithm to map PF change in Haiti and the Dominican Republic.
- Comprehensively compare the PF status between Haiti and the Dominican Republic, including PF conversion pattern, PF change inside and outside protected area, PF topography characteristics and fragmentation level.
- Quantify the PF loss area caused by fire, tree-cutting, hurricanes, and landslides.

Forecast the biodiversity extinction risk using land change simulation
Supervised independent research 01/2022 - present
- Simulate the historical and future land change change in Haiti and the Dominican Republic.
- Link the primary forest change with the area of habitat change for threatened species.
- Quantify the biodiversity extinction risk and protected area effectiveness.

Continuous mapping of impervious surface percentage (ISP)
Supervised independent research 01/2021 - present
- Employ massive very-high-resolution land cover data to create the ISP map for training.
- Train the convolution neural network with the ISP map and COLD algorithm outputs.
- Generate the 30-meter resolution ISP dataset over an extensive scale.
- Link the impervious surface area dynamic with socio-economic changes

Generation of global seamless daily mean land surface temperature (LST) dataset
Supervised independent research 09/2017 – 12/2020
- Enhancement of annual temperature cycle model by combining reanalysis data.
- Design a framework to generate physically true daily mean land surface temperature by combining the diurnal and annual temperature cycle models.
- Generate global daily mean LST from 2003 to 2019 and characterize the global LST trend.
- Validate the generated products with widely distributed *in-situ* measurements.

Comprehensive assessment of diurnal land surface temperature cycle (DTC) models under clear-sky condition
Supervised independent research 09/2016 – 05/2018
- Obtain nine representative four-parameter DTC models with a set of parameter-reduction strategies.
- Comprehensive assessment of the DTC models with geostationary satellite data and in-situ measurements.
- Provide the parameter-reduction order and the best-performance four-parameter DTC model.

updated on 03/17/2025

Publications

[1] **Hong, F.*,** Hedges, S. B., Yang, Z., Suh, J. W., Qiu, S., Timyan, J., & Zhu, Z. (2025). Decoding primary forest changes in Haiti and the Dominican Republic using Landsat time series. *Remote Sensing of Environment*, 318, 114590.

[2] **Hong, F.,** Zhan, W., Göttsche, F. M., Liu, Z., Dong, P., Fu, H., Hunag, F., Zhang, X. (2022). A global dataset of spatiotemporally seamless daily mean land surface temperatures: generation, validation, and analysis. *Earth System Science Data*, 14(7), 3091-3113.

[3] Liu, Z., Zhan, W., Lai, J., Bechtel, B., Lee, X., **Hong, F.,** Li, L., Huang, F., Li, J. (2022). Taxonomy of seasonal and diurnal clear-sky climatology of surface urban heat island dynamics across global cities. *ISPRS Journal of Photogrammetry and Remote Sensing*, 187, 14-33.

[4] Li, J., Zhan, W., **Hong, F.,** Lai, J., Dong, P., Liu, Z., Wang, C., Huang, F., Li, L., Wang, C., Fu, Y., (2021). Similarities and disparities in urban local heat islands responsive to regular-, stable-, and counter-urbanization: A case study of Guangzhou, China. *Building and Environment*, 199, 107935.

[5] Jiang, L., Zhan, W., Hu, L., Huang, F., **Hong, F.,** Liu, Z., Lai, J., Wang, C. (2021). Assessment of different kernel-driven models for daytime urban thermal radiation directionality simulation. *Remote Sensing of Environment*, 263, 112562.

[6] **Hong, F.,** Zhan, W., Göttsche, F.-M., Lai, J., Liu, Z., Hu, L., Fu, P., Huang, F., Li, J., Li, H., & Wu, H. (2021). A simple yet robust framework to estimate accurate daily mean land surface temperature from thermal observations of tandem polar orbiters. *Remote Sensing of Environment*, 264, 112612.

[7] Lai, J., Zhan, W., Quan, J., Liu, Z., Li, L., Huang, F., **Hong, F.,** Liao, W. (2021). Reconciling debates on the controls on surface urban heat island intensity: Effects of scale and sampling. *Geophysical Research Letters*, 48(19), 2021GL094485.

[8] Du, H., Zhan, W., Liu, Z., Li, J., Li, L., Lai, J., Miao, S., Huang, F., Wang, C., Wang, C., Fu, H., Jiang L., **Hong, F.,** Jiang, S. (2021). Simultaneous investigation of surface and canopy urban heat islands over global cities. *ISPRS Journal of Photogrammetry and Remote Sensing*, 181, 67-83.

[9] Jiang, S., Zhan, W., Yang, J., Liu, Z., Huang, F., Lai, J., Li, J., **Hong, F.,** Huang, Y., Chen, J., Lee, X., (2020). Urban heat island studies based on local climate zones: A systematic overview. *Acta Geographica Sinica*, 75(9), 1860-1878. In Chinese.

[10] Wang, C., Zhan, W., Liu, Z., Li, J., Li, L., Fu, P., Huang, F., Lai, J., Chen, J., **Hong, F.,** Jiang, S. (2020). Satellite-based mapping of the Universal Thermal Climate Index over the Yangtze River Delta urban agglomeration. *Journal of Cleaner Production*, 277, 123830.

[11] Liu, Z., Zhan, W., Lai, J., **Hong, F.,** Quan, J., Bechtel, B., Huang, F., Zou, Z. (2019). Balancing prediction accuracy and generalization ability: A hybrid framework for modelling the annual dynamics of satellite-derived land surface temperatures. *ISPRS Journal of Photogrammetry and Remote Sensing*, 151, 189-206.

[12] Lai, J., Zhan, W., Huang, F., Voogt, J., Bechtel, B., Allen, M., Peng, S., **Hong, F.,** Liu, Y., Du, P. (2018). Identification of typical diurnal patterns for clear-sky climatology of surface urban heat islands. *Remote Sensing of Environment*, 217, 203-220.

[13] Zou, Z., Zhan, W., Liu, Z., Bechtel, B., Gao, L., **Hong, F.**, Huang, F., Lai, J. (2018). Enhanced modeling of annual temperature cycles with temporally discrete remotely sensed thermal observations. *Remote Sensing*, 10(4), 650.

[14] **Hong, F.**, Zhan, W., Göttsche, F.M., Liu, Z., Zhou, J., Huang, F., Lai, J., Li, M. (2018). Comprehensive assessment of four-parameter diurnal land surface temperature cycle models under clear-sky. *ISPRS Journal of Photogrammetry and Remote Sensing*, 142, 190-204.

Professional Services

Journal review (number of review times)

[1] Remote Sensing of Environment (19)

[2] ISPRS Journal of Photogrammetry and Remote Sensing (4)

[3] Science of Remote Sensing (7)

[4] International Journal of Applied Earth Observation and Geoinformation (3)

[5] Journal of Selected Topics in Applied Earth Observations and Remote Sensing (2)

[6] Sustainable Cities and Society (5)

[7] Building and Environment (5)

[8] Journal of Cleaner Production (4)

[9] Science of The Total Environment (2)

Awards and Honors

- Conference Participation Award, University of Connecticut   2023
- Jorgensen Fellowship, University of Connecticut   2020-2025
- National Scholarship, Nanjing University   2019
- Best poster award of 4th Quantitative Remote Sensing Forum   2019
- Outstanding postgraduate students in Nanjing University   2018

Skills

- Computer language: Python, Linux, High-Parallel Computing, Google Earth Engine
- Software: QGIS, ArcGIS, ENVI, OriginLab
- Language: Chinese as mother language; Fluent in English

updated on 03/17/2025