

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

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| 09/2020 – 08/2025 (expected) | University of Connecticut, Connecticut, U.S.A. Ph.D. in Natural Resources: Land, Water, and Air Dissertation: <i>Remote Sensing the Human Impact: Mapping impervious Surface Dynamics, Primary Forest Loss, and Biodiversity Extinction Risk</i> Advisor: Zhe Zhu |
| 09/2017 – 07/2020 | Nanjing University, China Master in Cartography and Geographic Information System Dissertation: <i>Estimation and Validation of Global Physically True Daily Mean Land Surface Temperature</i> 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 (COtinuous 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.
- Identify the primary PF loss drivers and 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 amphibian species.
- Quantify the biodiversity extinction risk and protected area effectiveness.

CONUS-wide subpixel impervious surface percentage (ISP) dynamics: Mapping and spatiotemporal trends

Supervised independent research

01/2021 - present

- Employ massive very-high-resolution land cover data to create the ISP map for training.
- Train the deep learning model with the ISP map and Continuous Change Detection outputs.
- Generate the 30-meter resolution subpixel-level ISP dataset for the conterminous United States (CONUS).
- Analyze the spatiotemporal changes of CONUS impervious surface during the past four decades.

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.

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

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| • 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