

RESEARCH SEMINAR

DEPARTMENT OF GEOGRAPHY AND RESOURCE MANAGEMENT
THE CHINESE UNIVERSITY OF HONG KONG

Deep learning for large area land cover mapping using Landsat time series

14 Sep 2023 (Thur)

4:30 – 6:00 pm (UTC+8)

ZOOM ID: 895 147 7468

ZOOM Passcode: 858616

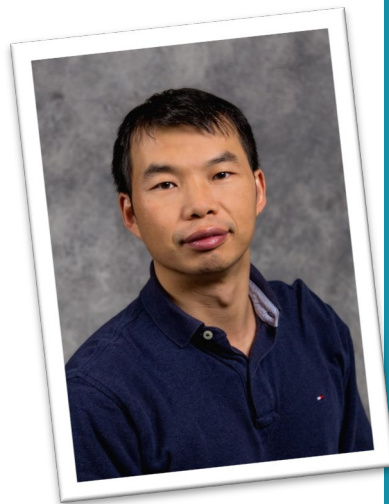
Deep learning has been used for land cover mapping using high spatial resolution (<5 m spatial resolution) images for almost a decade to explore spatial correlation in image. However, continental or global land cover maps are often produced using medium spatial resolution (e.g., 30m Landsat) time series data to take advantage of the inter-class differences in spectral changes over time. It is difficult to apply deep learning as the Landsat time series was irregular with different time series lengths and different acquisition dates for different pixel locations and years. This study presents two methods to handle this issue and demonstrates the methods to classify land cover over the continental United States (CONUS). The first method extracts a fixed number of percentile values from the time series and then classifies the percentiles using a 1-dimensional Convolutional Neural Networks (CNN). While the second method directly classifies the raw irregular time series (CRIT) using the recently developed Transformer model. The CRIT has better accuracy and is more computationally efficient. The CRIT application to land surface parameter retrieval, such as aerosol optical depth and soil moisture from remote sensing is also discussed.

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Hankui K. Zhang is an Assistant Professor at the Geospatial Sciences Center of Excellence co-founded by the South Dakota State University (SDSU) and USGS Earth Resources Observation and Science (EROS) Center. He got his PhD degree from the Chinese University of Hong Kong in 2013. He is now doing research in making satellite data ready to use and large area land cover mapping. He has been published >60 SCI papers that gained >4000 citations. His H index is 30. His developed Landsat BRDF correction method has been adopted by NASA to produce Harmonized Landsat and Sentinel-2 (HLS) products.



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