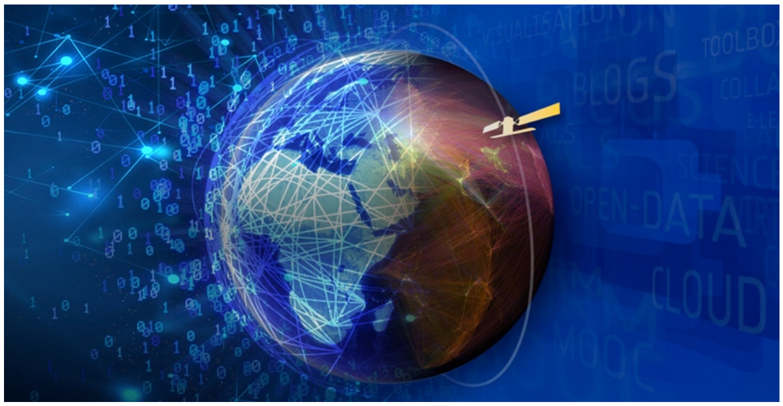
Research Seminar

Tuesday, April 25, 2023
2:30 PM - 4:00 PM in 1022 HN

Artificial Intelligence (AI) and Spatiotemporal Methodologies for Natural Phenomena Analysis



Presented by
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Natural phenomena are intrinsically spatiotemporal and highly dynamic, which require accurate and effective detection, segmentation, and estimation, as well as the in-depth understanding of physical and atmospheric process. The increasing availability of remote sensing images, ground-based observations, and model simulations along with the rapid progress of computing technologies have provided us the unprecedented opportunity to better satisfy the above-mentioned requirements. This leads to better understanding their patterns and potential impacts to human, property, climate, and the Earth system. My research focused on leveraging AI and spatiotemporal methodologies, and multi-source data calibration and fusion to study climate and environmental factors. Beyond the traditional methodology, I pursue high-efficient and automatic approaches by developing a series of deep learning models and frameworks to detect sub-pixel clouds, retrieve cloud fractions, and classify rainy clouds using multiple remote sensing data. With the intuitive analytical results, the research directly benefits the scientists, decision-makers, and the public for natural disaster research and mitigation purposes. The proposed methods also address the cloud-contamination issue in the development and applications of climate models.

In addition to work related to atmospheric science, I also conducted spatiotemporal analysis of environmental factors' patterns during COVID-19, and their interactions with human activities. The results can offer vital and practical basis for loss assessment and economic reopening and planning.

THE DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL SCIENCE