

Understanding Urbanization and Socioeconomic Changes with Nighttime Light Imagery: Applications and Challenges

Abstract

The Anthropocene has seen an unprecedentedly changing nightscape in human settlement areas, from pitch dark to brightly lit. In the past three decades, the arresting contrast between brightness and darkness presented in remotely-sensed nighttime light (NTL) imagery has made it a global icon depicting this changing nightscape in a spatially explicit way.

Due to a close association with human activities, NTL data have been extensively used in characterizing urbanization, mapping population changes, estimating socioeconomic variables, studying light pollution, etc. The recent proliferation of NTL sensors, algorithms, and products creates new opportunities for NTL-based applications, together with challenges in many aspects of NTL data. This seminar will showcase how new developments in NTL data can advance NTL-based applications and will discuss the major challenges in NTL-based applications (e.g. how to ensure temporal consistency in population density mapping) and NTL image processing (e.g. gap-filling).