MS-GIST Projects Spring 2023 Thursday, April 27

* There will be 5 minute breaks between each back-to-back presentation to facilitate transitions in Zoom.

** Zoom links are available on request. Please contact Andrew Grogan - atgrogan@arizona.edu

Date/Time	Presentation Title	Student Name
04/27/23 04:00 - 04:25 PM	Validating surface water detection methods using a hand-labeled PlanetScope dataset	Ruixue Wang

Validating surface water detection methods using a hand-labeled PlanetScope dataset

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04/27/23, 04:00 - 04:25 PM

Abstract:

Mapping and monitoring global surface water is crucial for natural resource management. Additionally, the ability to accurately map surface water benefits disaster response during and after flood events. Recent growth in satellite data availability along with the capacity to computationally manage large volumes of data has facilitated a rapid increase in surface water mapping techniques. From a review of the literature, it is our impression that frequently, studies evaluate their methods in predetermined, carefully selected locations and remain untested for a globally representative set of locations. Even though a wide variety of techniques exist, there are no common datasets specifically for validating surface water mapping accuracy. In this study, we present a validation dataset for surface water detection built using hand-labeled PlanetScope imagery including categories - water, nonwater, and low-confidence water. The high spatial resolution of PlanetScope (3m) will be ideal for evaluating surface water products at lower resolutions of 30m, 20m, or 10m. We are labeling 120 PlanetScope images, with 90 examples of permanent water and 30 of flood events, sampled globally. Each image is labeled using Labelbox and is of size 1024x1024 pixels. We used a systematic random sampling strategy with an objective to capture surface water in different conditions across biomes, rivers, lakes, dams, and others. To demonstrate the usefulness of our dataset, we will use it to evaluate two methods of mapping water using ESA Sentinel-1 data - the "10% solution" based on modeling the backscatter histogram of Sentinel-1 sub-scenes as bimodal Gaussian distributions, and a convolutional network approach. The objective of this dataset is to provide researchers with a global surface water dataset to evaluate their own surface water mapping methods.

Keywords: