

River morphology classification using image recognition

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Project description

Rivers are typically classified into four morphological types based on the following characteristics: channel sinuosity, the presence of depositional bars, the curvature of river bends, and the number of channels within the channel belt. According to these criteria, rivers can be categorized as one of the following types: Meandering (a sinuous single channel), Wandering (a single channel without a regular sinuous pattern), Braided (a channel with mid-channel bars), and Anastomosing (a river consisting of multiple channels that form islands).

A global classification of river types has not yet been fully realized, and regional studies have often used slightly different criteria for distinguishing between the various morphologies. However, with the increasing resolution and coverage of satellite imagery, it is now feasible to create a global classification of river types.

In this project, we aim to systematically classify rivers into these morphological types using image recognition of satellite imagery. This research builds upon earlier work and seeks to develop an unsupervised method for identifying river morphologies on a global dataset. The goal is to procedurally cluster the geometric properties of river channels and detect which features define different river types.

The work will entail:

- Understanding the previously created code and applying this code to a global dataset
- Using the results from the algorithm to identify clusters with different river morphologies

This project offers an unique opportunity to learn about programming and gain experience in the application of image recognition in the field of geoscience.

Job requirements

Candidates have a background or affinity in Python programming and in specific machine learning and a rudimentary knowledge about river morphology.