Identifying prehistoric structures in Colombia using UAV LiDAR data and neural networks

UAV LiDAR flight (left) and terrace structure (right) in Colombian rain forest

Terrace found in the UAV LiDAR data

Introduction

The Sierra Nevada de Santa Marta in Northern Colombia is an area characterized by snow-covered mountains and primordial rain forests. These mountains are also home to indigenous communities and contain thousands of pre-Columbian archaeological structures, such as terraces, burials, retaining walls, paths and staircases. In August 2024 a UAV-LiDAR system was used to scan part of this area. [1]

Goal

The primary objective is to use the acquired UAV LiDAR data to locate terraces and ancient pathways, which are hidden from the bare eye in the rain forest. These identified features will then serve as a foundation for training a neural network using a range of geospatial datasets, including DEMs, orthophotos, and satellite imagery. By integrating multiple data sources, this project aims to develop an accurate and automated approach for the detection of archaeological structures in rain forests. The resulting tool will contribute to more efficient archaeological surveys and preservation efforts by improving the ability to map cultural landscapes.

Embedding

The work will be performed at the TU Delft, Dept. of Geoscience and Remote Sensing. Coding skills in combination with using Python libraries such as TensorFlow and Pytorch are recommended. Interpretation of the results will be in direct cooperation with Sebastian Fajardo Bernal from Leiden University

More information and Supervision

The supervision team will include Felix Dahle, f.dahle_@tudelft.nl and Roderik Lindenbergh, r.c.lindenbergh@tudelft.nl

1 Compare also: https://www.universiteitleiden.nl/en/news/2024/01/lde-global-support-grant-for-method-development-on-the-remote-sensing-detection-of-archaeological-features-in-colombia