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# Tree Species Mapping Using Machine Learning Methods on Earth Observation Satellite Images

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## Abstract

In recent years, remote sensing technology has advanced significantly, particularly in diversifying available sensors, improving spatial and spectral resolutions, and enhancing data acquisition capabilities. These advancements have greatly increased the precision and applicability of Earth Observation (EO) technology across various fields. One key area of interest emerging from these developments is the classification of Tree Species. High-resolution satellite imagery combined with machine learning algorithms offers unprecedented potential for producing fine-scale, spatially explicit Tree Species maps. These maps improve ecological understanding and enhance resource inventories, carbon stock estimation, and forest health monitoring. This article explores the growing interest in Tree Species classification by analyzing current trends in Artificial Intelligence and Machine Learning models applied to remote sensing applications and identifying existing gaps in the field. Additionally, it examines the most commonly used satellite sensors, evaluates auxiliary data supporting Tree Species classification, and compares popular classification methods.

**Keywords:** tree species classification, machine learning, deep learning, remote sensing

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