
Master Thesis: AI-Based Tree Species Classification and Disturbance Analysis Using Sentinel-2 Time Series in Bavaria



Start Date: Anytime

Description of Project:

Forests cover roughly one-third of Bavaria's land, but they face increasing challenges from climate extremes such as bark beetle outbreaks in spruce and drought in beech. This master thesis develops an AI-based method to classify tree species using Sentinel-2 satellite time series. The data is derived from a subset of the Sentinel-2 machine learning dataset for tree species classification in Germany which contains bottom-of-atmosphere (BOA) reflectance processed with the FORCE pipeline and linked to the German National Forest Inventory (NFI) of 2012. Following classification, the time series data could possibly be analysed to quantify species-specific responses to disturbance events, providing crucial insights into forest health and resilience.

Research Question (Pick 1 or any) :

1. How effectively can CNNs classify tree species using spaceborne multispectral images (Sentinel-2)?
2. How accurate are AI based specie-wise disturbance mapping done with just spectral-temporal metrics?
3. Are some species more susceptible/resilient to damage?

Key Outcomes:

- Building a CNN based classification model for tree species classification from Sentinel 2 images
- Derive specie wise response of trees to disturbance with spectral-temporal metrics

Contact:

Srilakshmi Nagarajan

srilakshmi.nagarajan@tum.de



S2 ML Dataset