

## **Forest species determination from satellite data**

### **Abstract**

This thesis examines the species composition of forests from satellite images using the pixel classification. The research was done on 24 forest locations in The Ustecký Region, The Karlovarský Region, The Plzeňský Region and The Central Bohemian Region in the Czech Republic. In this thesis, data from the Landsat-8 and Sentinel-2 satellites from summer season and the Random Forest Classifier method were used. The layer of species composition of forests from map portal LhpoMap was used as reference data.

The method of work consisted of a broad literature search to select the most favourable classifier and to choose the most advantageous input parameter values to achieve the highest overall accuracy of the classification.

The practical part was focused on creating a software classification process. The accuracy of the individual image values was verified using matrix errors.

Based on the literature search, the Random Forest classifier was used to classify the images. Parameter values were used for the Gini criterion, 500 decision trees, and the other parameters were left with default values. The entire classification process was performed in ArcMap and ArcGIS Pro software using Python programming language with the help of the sklearn.ensemble module and its libraries.

The results of the image classification achieved from 88 to 96% of accuracy.

**Keywords:** remote sensing, forest canopy, forest tree types, forestry map