

Modelling of selected forest geometric parameters from airborne laser scanning data

Abstract

The main aim of this work is to approximate the shape of a tree crown with mathematically describable 3D shape based on airborne laser scanning (ALS) data. And consequently derive geometrical parameters describing the tree from this model. Included in the work is a custom designed algorithm based on angular segmentation. Measured results of this algorithm are then compared to an algorithm based on RANSAC and field measurement. The first part of this work describes airborne laser scanning, its use to derive characteristics of forest stands and individual trees and the theory of tree crown modelling. The next part contains a description of both algorithms and presentation of results and field measurements. The conclusion summarizes and evaluates the outputs of the custom angular segmentation algorithm and discusses its possible modifications.

Keywords: airborne laser scanning, tree height, crown width, crown height, crown cover, crown volume, crown shape, RANSAC