Professur für Waldwachstum und Dendroökologie, Tennenbacher Str. 4,79106 Freiburg

Master Thesis

Taper curve development for very large trees

Albert-Ludwigs-Universität Freiburg

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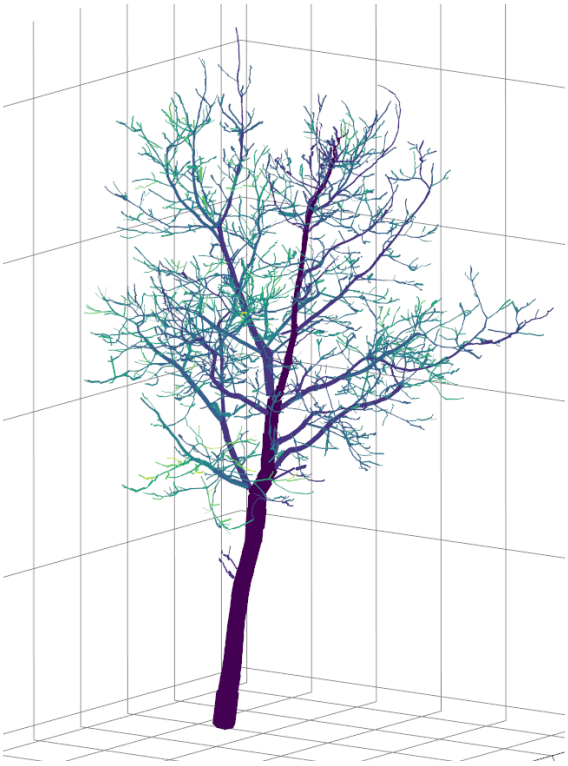
Taper curves, i.e. the diameter-height relation along a trunk, are the basis for volume calculation of trees, e.g. in German national forest inventories. However, there are gaps in knowledge for very large trees (Bhd > 80 cm).

The aim of this master thesis is to develop and test a methodological framework (proof-of-concept) to build a digital 3D-image of large trees with **terrestrial laser scanning** (TLS) and to measure them with **Quantitative Structure Models** (QSM, software available). In parallel, these trees will be recorded and an established method using rope climbing techniques (Seil-Kletter-Technik, SKT) and randomised branch sampling (RBS). The aim is to prove the suitability of the method for data acquisition and the development of new taper curve functions for deciduous tree species.

Tasks:

- Selection of sample trees in Freiburg region (beech / oak)
- Recording of sample trees in a leaf-off conditions from multiple viewpoints using TLS
- Derivation of the solid wood volume with Quantitative Structure Models (QSM) up to 7 cm branch diameter
- Accompanying the RBS measurements
- Comparison of volume estimation from QSM, RBS and taper curves
- Documentation of the Workflow



For this work, we are looking for a motivated Master's student who is not only interested in field or computer work, but would like to combine both. If you are competent in rope climbing techniques, you could be involved in the RBS data acquisition (student assistant contract).

We offer a pleasant working environment, expertise in the subject area and adequate support. The work takes place in cooperation with the FVA-BW, Department of Biometrics and Informatics.

If you have any questions or are interested, please contact:

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