



Tree ring detection for Quantitative Wood Anatomy (QWA)

Quantitative Wood Anatomy (QWA) analyzes multiple anatomical features of microscopic wood images of thin sections. These features (e.g., tree rings) can be directly related to environmental influences during tree growth. In current software, tree rings and other features are inferred from the detected cells, which is error-prone if the detection algorithm misses the smallest cells that are hardest to detect. We thus aim to use a deep neural network to directly identify tree ring borders without reliance on cell segmentation. Additionally we want to investigate if other features e.g. cell wall thickness can be directly estimated.

Keywords:

Deep Learning, Tree Ring detection, Quantitative Wood Anatomy, microscopic thin slice images.

Labels:

Bachelor Thesis, Master Thesis

Goal

- Literature review for tree ring detection with deep neural networks
- Validation and improvement of the automatic tree ring detection to create a dataset
- Implement a deep learning algorithm to detect tree rings
- Quantitative evaluation with appropriate metric
- Investigation if other anatomical features can be estimated reliably

Contact Details

Marc Katzenmaier (marc.katzenmaier@uzh.ch) Institut for Computational Sciences ,
University of Zurich