Mihai Pătraşcu

"Looking for the trees in the forest"
An attempt to finding the best segmentation-based methodology to discriminate deciduous trees in the Dubbarp area, Sweden

Finding a solution to automatically identify tree crowns in has been a well discussed topic in the academic community. Different ideas have been put to practice, with researches mainly targeting coniferous forests. In a global context, papers concerning deciduous trees are rare and their results differ in relation to their respective study zone. Segmentation-based methodologies are a newcomer in the world of wide area remote sensing and their predicting power still needs to be put to test.

Modern software such as Trimble's eCognition enables the end-user the power to easily configure the parametrizations of complex object creating algorithms. This paper applies the multi-resolution segmentation algorithm to a study area in in southern Sweden, in an attempt to find the best methodology for automatic tree crown recognition of trees worthy of protection. Trees worthy of protection host a wide variety of entomofauna and have been defined by the Swedish Environment Protection Agency as important elements in their plan to preserve the country's endangered ecosystems. They are usually old deciduous trees with an extended crown.

Fourteen experiments based on different parametrizations of the multi-resolution segmentation algorithm have been carried on available LiDAR and near-infrared data from the study area. Their results show that two dimensional elevation data and seasonal difference in near-infrared value are not sufficient conditions to accurately pinpoint the location of the crowns belonging to the trees worthy of protection.

Discussion about the possible shortcomings of the research and suggestions for future exploration are also provided in the paper.