



Early wood quality assessment for a better use of the forest resource.

The DigiMedFor project

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INTRODUCTION

Along the forest-wood value chain, wood quality is often assessed on the semi-finished or finished product stage. Anticipating the quality evaluation to forests stands or roundwood soon after logging could provide additional advantages from both a forest management and resource exploitation perspective. Having information about quality besides quantity could support decision-makers in silvicultural choices to cultivate value. As well as, a better understanding of the wood resource would optimize selling and purchasing decisions, finding the best destination for the material according to its qualitative characteristics.

AIMS

The DigiMedFor project aims to modernise the technological land-scape of the Mediterranean forest-wood supply chain (<https://digimedfor.eu/>).

The project focuses on simultaneously enhancing competitiveness and promoting sustainable management by, among other initiatives, implementing quick and easy-to-use tools for assessing the quality of standing trees and logs. Here, the activities done to evaluate standing trees are presented.

METHODS

Trestima mobile application is used to assign to each forest unit a quality index related to the quality of the trees inside it. It works on pictures taken from the mobile camera while walking across the forest. Thanks to image analysis techniques, tree stems are segmented and analysed.

A survey was done to evaluate the quality of Douglas fir tree stems in 31 forest units. A quality index was elaborated so to divide the plot into 3 classes (being the class 1 the best and 3 the worst). The index was based mainly on the first 5-6 m stem form and branchiness. A quality index was assigned to each surveyed plot. Pictures were taken with the mobile app in all the plots, and a training was carried out to predict the quality index of the plot.



Fig. 1. Image analyzed by Trestima app for tree recognition and diameter measurement



Fig. 2. Stem and branch analysis.

RESULTS

The application was effective in segmenting stems. However, further refinement is required for branchiness, as the segmentation was not sufficiently accurate for longer branches.

The correlation between the Human-made quality index and the Trestima QI prediction was moderately significant ($r = 0.57$).

Efforts are currently underway to enhance the detection of protruding branches, which is expected to significantly improve the picture-based quality predictions.

Classification Table Quality class prediction		obs		
		1	2	3
preds	1	5	1	1
	2	1	13	2
	3	0	4	4

