Extracting DBH measurements from RGB photo images

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Forest inventory requires significant financial investment and is labor intensive. Despite efforts of most forest management agencies, field inventory is often quite inefficient with final sample proportions less than 1%. In addition, measurement results are influenced by many factors, and correcting errors often requires revisiting field sites and/or complex rules that may introduce bias. Foresters have always searched for more efficient methods to obtain forest parameters, such as diameter at breast height (DBH). While many tools were developed over the years, most are still time consuming, and all require field checking to correct measurement errors. The availability of essentially free digital images posses a permanent record of trees that can be remeasured without having to return to the field. This report presents one method to extract DBH measurements from digital images using a digital camera and visible laser lines. Both the distance from camera and DBH results are validated using field measurements and show a good accuracy: 41.5% of DBH measurements were within ± 0.5 cm of field measured DBH and 25.1% were within ± 0.5 cm to 1.0 cm. An open source software package called ImageDBH developed in Python enables users to obtain DBH directly from the digital images.

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