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Accuracy of photo-optical measurement of wood piles

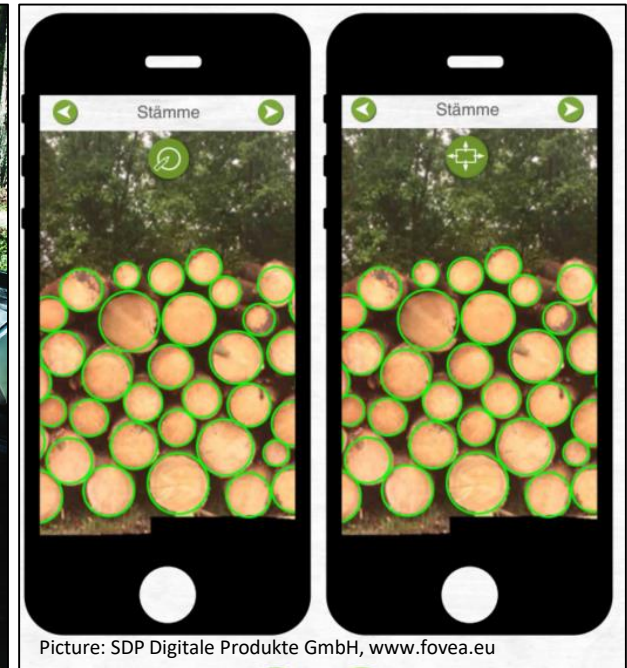
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Introduction – Measurement of wood piles

- Manual measurement with equal-length sections
- Calibrated measurement with stereo camera technology
- Photo-optical measurement with smartphone apps





Material & methods

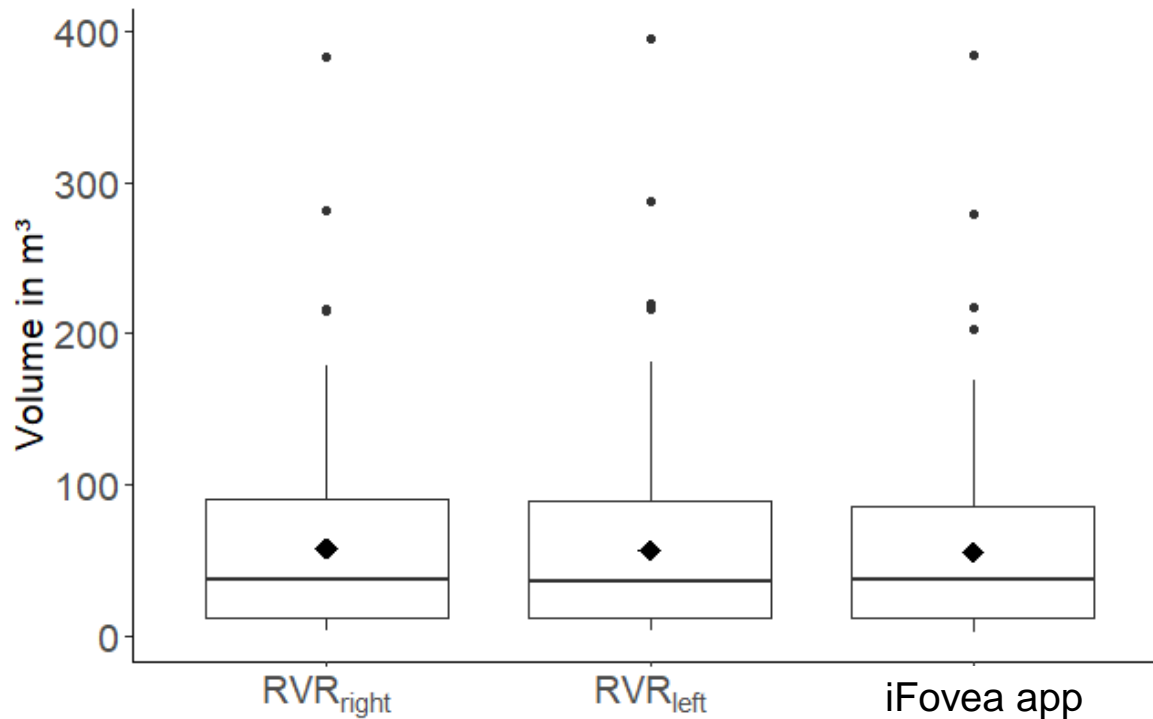
- NE-Germany
- Oct. 2019 to Apr. 2020
- 109 wood piles
- Broadleaved tree species (mainly beech and ash)
- Industrial timber assortments



- Manual measurement twice acc. to German sorting guideline (RVR_1): starting from the left (RVR_{left}) and starting from the right side (RVR_{right}) of the pile
- Photo-optical measurement using the FOVEA App



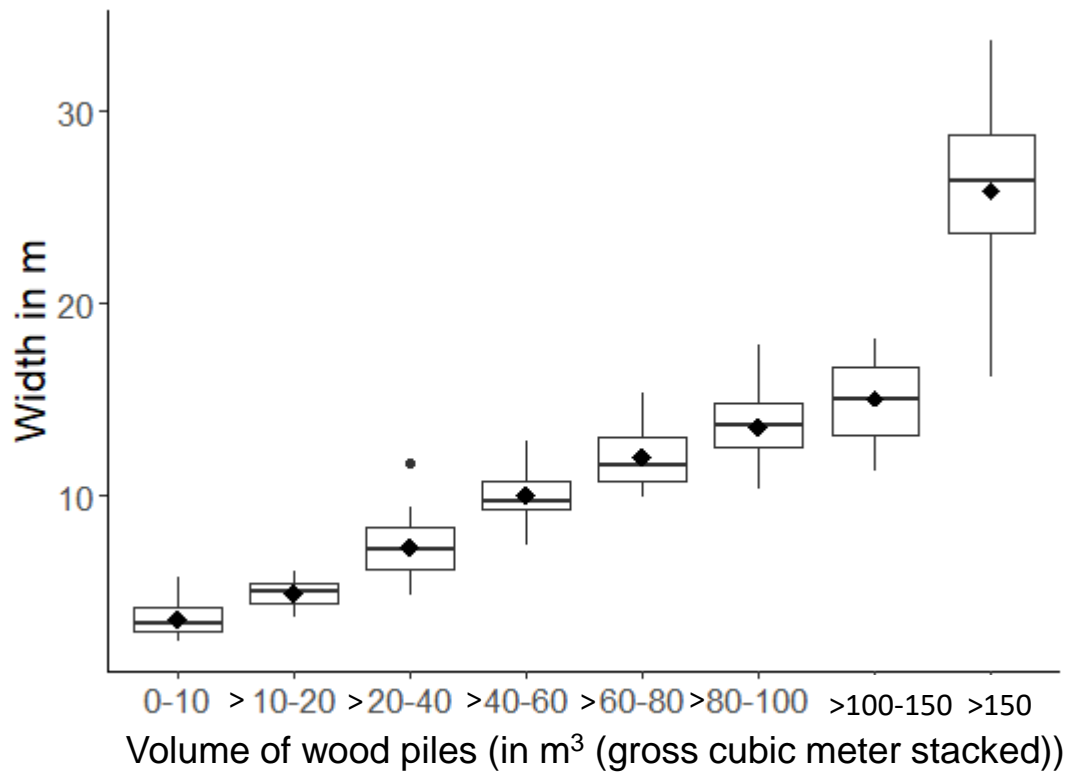
Results



The mean gross volume over all piles was 56.53, 57.22 and 55.50 m³ for the measurement with RVR_{left}, RVR_{right} and iFOVEA, respectively.



Results

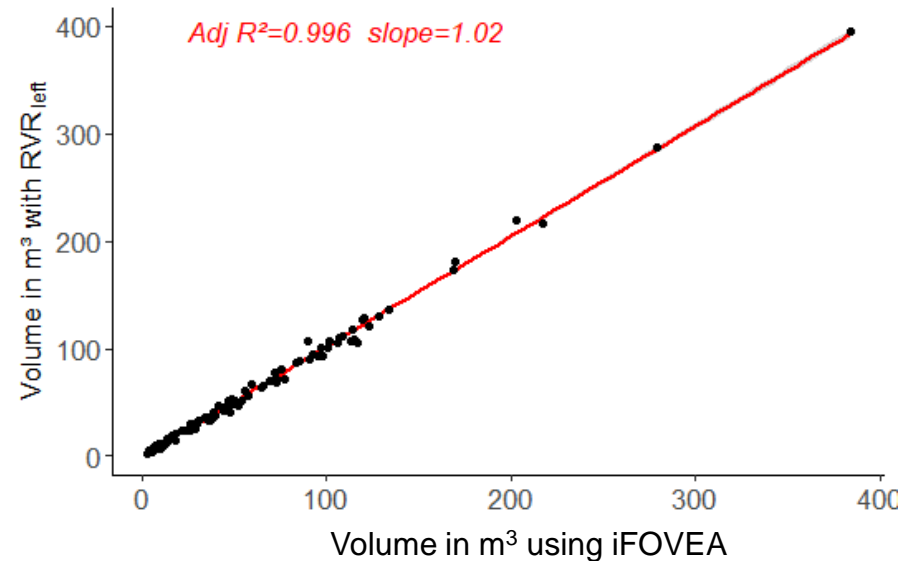
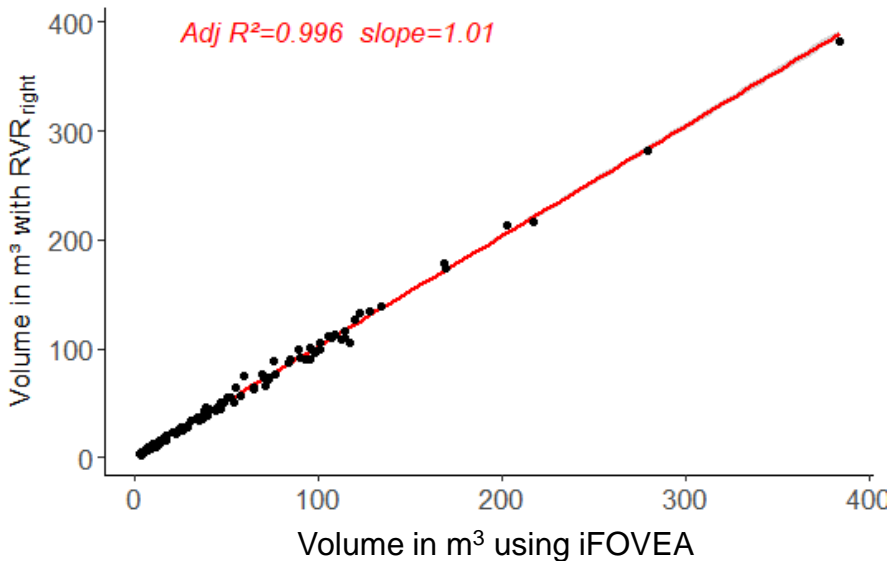


The piles were grouped into eight classes according to volume (gross stacked cubic meter (i.e. including bark and interstices))

It can be shown that the width of pile strongly correlates with the volume of piles



Results



Generally, a very high congruence between the results of the manual measurement (according to RVR) and results of the photo-optical measurements can be seen



Discussion

- Strong correlation between the manually derived wood pile volumes and the photo-optical measurements is in accordance with previous findings
- Higher variance between the results for small piles shows justification for the pile requirements formulated in the guidelines for both approaches (recommended minimum size of piles of 20 m³)
- Generally, photo-optical approaches can offer a meaningful solution for wood pile measurement, especially when marketing large volumes of piles of good quality.



Outlook

1. Variance between the different volume estimation approaches
2. Effect of quality and size of pile on volume estimation accuracy.





Outlook

1. Variance between the different volume estimation approaches
2. Effect of quality and size of pile on volume estimation accuracy.
3. Effect of tree species on volume estimation accuracy.



A large stack of cut logs is piled up in a forest. The logs are stacked in a neat, rectangular pile, with the ends of the logs facing the viewer. The logs are light brown and show the natural grain of the wood. The background is a dense forest of green trees. The ground is covered with grass and some small plants. The overall scene is bright and sunny.

Thanks a lot for your attention!

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