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| **Monitoring And Extending Permanent Sample Plots By Remote Sensing Methods** |
| **Introduction/Aim:** There are approximately 3000 permanent sample plots with seven main tree species in Hungary aiming growth and sylvicultural research. Most of the sample plots were established in the 60-ies. These very valuable datasets however have a quite significant drawback, as there is generally no single tree position recorded of the parcels. The primary aim of this research to demonstrate how state of the art remote sensing methods can effectively eliminate this drawback, and appreciably improve the general usage of the datasets. **Methods:** The stem mapping of some of these sample plots have been carried out by traditional filed surveys, terrestrial laser scanning, airborne digital photogrammetry and airborne laser scanning. The later ones were applied on UAVs. The methods were further developed to more effectively and more accurately detect the stem positions and DBH from terrestrial laser scanning dataset. New methods were introduce to detect the stem positions, height and DBH from very high resolution (1-2 cm) aerial images and airborne laser scanning.**Results:** A methodological guideline have been created to suggest an effective and accurate methods for stem mapping of these sample plots. Additionally the methods have been tested on six selected sample sites. The results can also be used to apply archive aerial photography to accurately estimate the height-growth of the sample sites. **Conclusion:** Applying our methods the usage of these sample sites can be extended in more accurate and advance research in Hungarian growth and sylviculture.**Acknowledgment:** This research has been carried out with the support provided by the Ministry of Culture and Innovation of Hungary from the National Research, Development and Innovation Fund, financed under the TKP2021-NVA funding scheme, in frame of the project TKP2021-NVA-13. |

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