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Qualifications

Educational science, University pedagogy, Teacher's separate pedagogical studies, Faculty of Educational Sciences
Award Date: 18 Dec 2023

Agriculture and Forestry, Doctor of Science (Forestry), PhD thesis: Measuring tree growth using terrestrial laser scanning, Faculty of Agriculture and Forestry
Award Date: 15 Nov 2022

Agriculture and forestry, Master of Science (Forestry, forest ecology and management), Faculty of Agriculture and Forestry
Award Date: 13 Nov 2013

Employment

Research Coordinator

Department of Forest Sciences
University of Helsinki
Finland
6 May 2024 → present

Laboratory of Forest Resources Management and Geo-information Science

University of Helsinki
Finland
1 Jan 2014 → present

Publications

Accuracy comparison of terrestrial and airborne laser scanning and manual measurements for stem curve-based growth measurements of individual trees

Soininen, V., Hyyppä, E., Muhojoki, J., Luoma, V., Kaartinen, H., Lehtomäki, M., Kukko, A. & Hyyppä, J., Jun 2024, In: Science of Remote Sensing. 9, 100125.

Tree height and stem growth dynamics in a Scots pine dominated boreal forest

Yrttimaa, T., Junttila, S., Luoma, V., Pyörälä, J., Puttonen, E., Campos, M., Hölttä, T. & Vastaranta, M., Mar 2024, In: Trees, forests and people. 15, 15 p., 100468.

A method for identifying and segmenting branches of Scots pine (*Pinus sylvestris* L.) trees using terrestrial laser scanning

Yrttimaa, T., Kankare, V., Luoma, V., Junttila, S., Saarinen, N., Calders, K., Holopainen, M., Hyyppä, J. & Vastaranta, M., 4 Dec 2023, In: Forestry. 15 p.

A New Approach for Feeding Multispectral Imagery into Convolutional Neural Networks Improved Classification of Seedlings

Imangholiloo, M., Luoma, V., Holopainen, M., Vastaranta, M., Makelainen, A., Koivumäki, N., Honkavaara, E. & Khoramshahi, E., Nov 2023, In: Remote Sensing. 15, 21, 27 p.

Individual tree segmentation and species classification using high-density close-range multispectral laser scanning data
Hakula, A., Ruoppa, L., Lehtomäki, M., Yu, X., Kukko, A., Kaartinen, H., Taher, J., Matikainen, L., Hyyppä, E., Luoma, V., Holopainen, M., Kankare, V. & Hyyppä, J., Aug 2023, In: ISPRS Open Journal of Photogrammetry and Remote Sensing. 9 , 13 p., 100039.

Capturing seasonal radial growth of boreal trees with terrestrial laser scanning

Yrttimaa, T., Junttila, S., Luoma, V., Calders, K., Kankare, V., Saarinen, N., Kukko, A., Holopainen, M., Hyyppä, J. & Vastaranta, M., 1 Feb 2023, In: Forest Ecology and Management. 529, 10 p.

Predicting Growth of Individual Trees Directly and Indirectly Using 20-Year Bitemporal Airborne Laser Scanning Point Cloud Data

Soininen, V., Kukko, A., Yu, X., Kaartinen, H., Luoma, V., Saikkonen, O., Holopainen, M., Matikainen, L., Lehtomäki, M. & Hyyppä, J., Dec 2022, In: Forests. 13, 12, 21 p.

Feasibility of Bi-Temporal Airborne Laser Scanning Data in Detecting Species-Specific Individual Tree Crown Growth of Boreal Forests

Poorazimy, M., Ronoud, G., Yu, X., Luoma, V., Hyyppä, J., Saarinen, N., Kankare, V. & Vastaranta, M., Oct 2022, In: Remote Sensing. 14, 19, 17 p., 4845.

Measuring tree growth using terrestrial laser scanning

Luoma, V., Oct 2022, Helsinki: Finnish Society of Forest Science. 48 p.

Terrestrial Laser Scanning in Assessing the Effect of Different Thinning Treatments on the Competition of Scots Pine (*Pinus sylvestris* L.) Forests

Ronoud, G., Poorazimy, M., Yrttimaa, T., Luoma, V., Huuskonen, S., Hynynen, J., Hyyppä, J., Saarinen, N., Kankare, V. & Vastaranta, M., Oct 2022, In: Remote Sensing. 14, 20, 18 p., 5196.

Exploring tree growth allometry using two-date terrestrial laser scanning

Yrttimaa, T., Luoma, V., Saarinen, N., Kankare, E., Junttila, S., Holopainen, M., Hyyppä, J. & Vastaranta, M., 15 Aug 2022 , In: Forest Ecology and Management. 518, 13 p., 120303.

Assessing Structural Complexity of Individual Scots Pine Trees by Comparing Terrestrial Laser Scanning and Photogrammetric Point Clouds

Tienaho, N., Yrttimaa, T., Kankare, V., Vastaranta, M., Luoma, V., Honkavaara, E., Koivumäki, N., Huuskonen, S., Hynynen, J., Holopainen, M., Hyyppä, J. & Saarinen, N., Aug 2022, In: Forests. 13, 8, 19 p., 1305.

Effects of Stem Density on Crown Architecture of Scots Pine Trees

Saarinen, N., Kankare, V., Huuskonen, S., Hynynen, J., Bianchi, S., Yrttimaa, T., Luoma, V., Junttila, S., Holopainen, M., Hyyppä, J. & Vastaranta, M., 9 Mar 2022, In: Frontiers in plant science. 13, 14 p., 817792.

Crown shape and size of Scots pine affected by thinning?

Saarinen, N., Yrttimaa, T., Kankare, V., Luoma, V., Bianchi, S., Huuskonen, S., Hynynen, J., Holopainen, M., Hyyppä, J. & Vastaranta, M., 1 Dec 2021, *Proceedings of the SilviLaser Conference 2021*. TU Wien Academic Press, p. 117–119 (Geowissenschaftliche Mitteilungen).

Examining Structural Complexity of Scots Pine Trees – A Comparison between Terrestrial Laser Scanning and Photogrammetric Point Clouds

Tienaho, N. M., Saarinen, N., Yrttimaa, T., Luoma, V., Honkavaara, E., Viljanen, N., Huuskonen, S. & Hynynen, J., 1 Dec 2021, *Proceedings of the SilviLaser Conference 2021*. TU Wien Academic Press, p. 13-15 (Geowissenschaftliche Mitteilungen).

Terrestrial Laser Scanning Reveal Connection Between Changes in Tree Stem Dimensions and Crown Structure

Yrttimaa, T., Luoma, V., Saarinen, N., Kankare, V., Junttila, S., Holopainen, M., Hyyppä, J. & Vastaranta, M., 1 Dec 2021, *Proceedings of the SilviLaser Conference 2021*. TU Wien Academic Press, p. 176-178 3 p. (Geowissenschaftliche Mitteilungen).

Revealing Changes in the Stem Form and Volume Allocation in Diverse Boreal Forests Using Two-Date Terrestrial Laser Scanning

Luoma, V., Yrttimaa, T., Kankare, V., Saarinen, N., Pyöralä, J., Kukko, A., Kaartinen, H., Hyypä, J., Holopainen, M. & Vastaranta, M., Jul 2021, In: *Forests*. 12, 7, 20 p., 835.

Understanding 3D structural complexity of individual Scots pine trees with different management history

Saarinen, N., Calders, K., Kankare, V., Yrttimaa, T., Junttila, S., Luoma, V., Huuskonen, S., Hynynen, J. & Verbeeck, H., Mar 2021, In: *Ecology and Evolution*. 11, 6, p. 2561-2572 12 p.

Structural Changes in Boreal Forests Can Be Quantified Using Terrestrial Laser Scanning

Yrttimaa, T., Luoma, V., Saarinen, N., Kankare, V., Junttila, S., Holopainen, M., Hyypä, J. & Vastaranta, M., Sept 2020, In: *Remote Sensing*. 12, 17, p. 1-20 20 p., 2672.

Effect of canopy structure on the performance of tree mapping methods in urban parks

Tanhuanpää, T., Yu, X., Luoma, V., Saarinen, N., Raisio, J., Hyypä, J., Kumpula, T. & Holopainen, M., 23 Aug 2019, In: *Urban Forestry & Urban Greening*. 44, 12 p., 126441.

Detecting and characterizing downed dead wood using terrestrial laser scanning

Yrttimaa, T., Saarinen, N., Luoma, V., Tanhuanpää, T., Kankare, V., Liang, X., Hyypä, J., Holopainen, M. & Vastaranta, M., May 2019, In: *ISPRS Journal of Photogrammetry and Remote Sensing*. 151, p. 76-90 15 p.

Examining Changes in Stem Taper and Volume Growth with Two-Date 3D Point Clouds

Luoma, V., Saarinen, N., Kankare, V., Tanhuanpää, T., Kaartinen, H., Kukko, A., Holopainen, M., Hyypä, J. & Vastaranta, M., May 2019, In: *Forests*. 10, 5, 14 p., 382.

Assessing feasibility of the forest trafficability map for avoiding rutting - a case study

Kankare, V., Luoma, V., Saarinen, N., Peuhkurinen, J., Holopainen, M. & Vastaranta, M., 2019, In: *Silva Fennica*. 53, 3, 9 p., 10197.

International benchmarking of terrestrial laser scanning approaches for forest inventories: Part I: Objective, Datasets, Evaluation Criteria and Methods ((joint project of EuroSDR and ISPRS))

Liang, X., Hyypä, J., Kaartinen, H., Pyöralä, J., Lehtomäki, M., Holopainen, M., Kankare, V., Luoma, V., Saarinen, N., Chen, L. & Wang, Y., 2019, Vienna: Bundesamt für Eich- und Vermessungswesen. 29 p. (European Spatial Data Research. Official Publication; vol. 71, no. 1)

Aboveground forest biomass derived using multiple dates of WorldView-2 stereo-imagery: quantifying the improvement in estimation accuracy

Vastaranta, M., Yu, X., Luoma, V., Karjalainen, M., Saarinen, N., Wulder, M. A., White, J. C., Persson, H. J., Hollaus, M., Yrttimaa, T., Holopainen, M. & Hyypä, J., 2 Dec 2018, In: *International Journal of Remote Sensing*. 39, 23, p. 8766-8783 18 p.

International benchmarking of terrestrial laser scanning approaches for forest inventories

Liang, X., Hyypä, J., Kaartinen, H., Lehtomäki, M., Pyöralä, J., Pfeifer, N., Holopainen, M., Brolly, G., Francesco, P., Hackenberg, J., Huang, H., Jo, H-W., Katoh, M., Liu, L., Mokroš, M., Morel, J., Olofsson, K., Poveda-Lopez, J., Trochta, J., Wang, D., & 11 others Wang, J., Xi, Z., Yang, B., Zheng, G., Kankare, V., Luoma, V., Yu, X., Chen, L., Vastaranta, M., Saarinen, N. & Wang, Y., Oct 2018, In: *ISPRS Journal of Photogrammetry and Remote Sensing*. 144, p. 137-179 43 p.

Assessing Biodiversity in Boreal Forests with UAV-Based Photogrammetric Point Clouds and Hyperspectral Imaging

Saarinen, N., Vastaranta, M., Nasi, R., Rosnell, T., Hakala, T., Honkavaara, E., Wulder, M. A., Luoma, V., Tommaselli, A. M. G., Imai, N. N., Ribeiro, E. A. W., Guimaraes, R. B., Holopainen, M. & Hyypä, J., Feb 2018, In: *Remote Sensing*. 10, 2, 22 p., 338.

Airborne Laser Scanning Outperforms the Alternative 3D Techniques in Capturing Variation in Tree Height and Forest Density in Southern Boreal Forests

Vastaranta, M., Yrttimaa, T., Saarinen, N., Yu, X., Karjalainen, M., Nurminen, K., Karila, K., Kankare, V., Luoma, V., Pyöralä, J., Junttila, S., Tanhuanpää, T., Kaartinen, H., Kukko, A., Honkavaara, E., Jaakkola, A., Liang, X., Wang, Y.,

Vaaja, M., Hyyppä, H., & 4 othersKato, M., Wulder, M. A., Holopainen, M. & Hyyppä, J., 2018, In: *Baltic Forestry*. 24, 2, p. 268-277 10 p.

Assessing Precision in Conventional Field Measurements of Individual Tree Attributes

Luoma, V., Saarinen, N., Wulder, M. A., White, J. C., Vastaranta, M., Holopainen, M. & Hyyppä, J., Feb 2017, In: *Forests*. 8, 2, 16 p., 38.

Feasibility of Terrestrial laser scanning for collecting stem volume information from single trees

Saarinen, N., Kankare, V., Vastaranta, M., Luoma, V., Pyörälä, J., Tanhuanpää, T., Liang, X., Kaartinen, H., Kukko, A., Jaakkola, A., Yu, X., Holopainen, M. & Hyyppä, J., Jan 2017, In: *ISPRS Journal of Photogrammetry and Remote Sensing*. 123, p. 140-158 19 p.

Errors in the Short-Term Forest Resource Information Update

Luoma, V., Vastaranta, M., Eyvindson, K., Kankare, V., Saarinen, N., Holopainen, M. & Hyyppä, J., 2017, *The Rise of Big Spatial Data*. Ivan, I., Singleton, A., Horak, J. & Inspektor, T. (eds.). Springer International Publishing AG, p. 155-166 12 p. (Lecture Notes in Geoinformation and Cartography).

UAV-based photogrammetric point clouds and hyperspectral imaging for mapping biodiversity indicators in boreal forests

Saarinen, N. P., Vastaranta, M. A., Näsi, R., Rosnell, T., Hakala, T., Honkavaara, E., Wulder, M. A., Luoma, V. V., Tommaselli, A., Imai, N., Werneck, E., Guimaraes, R., Holopainen, M. E. & Hyyppä, J., 2017, In: *The international archives of the photogrammetry, remote sensing and spatial information sciences*. XLII-3/W3, p. 171-175 5 p.

Allocating Tree Crown Pruning with ALS-data - A Case Study in the City of Helsinki

Luoma, V., Tanhuanpää, T., Holopainen, M., Vastaranta, M., Saarinen, N., Kankare, V. & Hyyppä, J., 2015, *2015 Joint Urban Remote Sensing Event (JURSE) : March 30, 2015 - April 1, 2015, Lausanne, Switzerland*. Piscataway: IEEE, 4 p.

Evaluation of a Smartphone App for Forest Sample Plot Measurements

Vastaranta, M., Latorre, E. G., Luoma, V., Saarinen, N., Holopainen, M. & Hyyppä, J., 2015, In: *Forests*. 6, 4, p. 1179-1194 16 p.

Activities

Characterizing structural changes in boreal forests by combining terrestrial and airborne laser scanning point clouds

Ville Luoma (Speaker)

24 Jun 2024

Detection of tree growth and changes in tree and forest structures by utilizing terrestrial laser scanning point clouds

Ville Luoma (Speaker)

6 Sept 2023

Detection of tree growth and changes in tree and forest structures by utilizing terrestrial laser scanning point clouds

Ville Luoma (Speaker)

30 Aug 2023

Measuring tree growth using terrestrial laser scanning

Ville Luoma (Speaker)

10 Feb 2023

Measuring Tree Growth by Utilizing Two Date Terrestrial Laser Scanning Point Clouds

Ville Luoma (Speaker)

27 Jan 2023

Possibilities of change detection of tree and forest attributes by combining terrestrial laser scanning based 3D point clouds with UAV data

Ville Luoma (Speaker)

19 Mar 2020

Observing changes in stem form of individual trees by means of TLS-time series

Ville Luoma (Speaker)

10 Oct 2017

Observing changes in stem form of individual trees by means of TLS-time series

Ville Luoma (Speaker)

22 Aug 2017

Errors in the Short-Term Forest Resource Information Update

Ville Luoma (Speaker)

17 Mar 2016

Prizes

Vuoden opettaja

Luoma, Ville (Recipient), 28 Apr 2023

Projects

MULTIRISK: Digital technologies, risk management solutions and tools for mitigating forest disturbances (MULTIRISK)

Holopainen, M., Blomqvist, M., Imangholiloo, M., Junntila, S., Lahtinen, V. P., Luoma, V., O'Sullivan, H. J., Pehkonen, M. E. I., Pyörälä, J., Saikkonen, O. A., Suominen, O. M. E., Virtanen, I. M. & Yrttimaa, T.

Suomen Akatemia Projektilaskutus

01/01/2023 → 31/12/2025

Datasets

Terrestrial Laser Scanning and Ground Truth Data for Characterizing Downed Dead Wood

Yrttimaa, T. (Data Manager), Saarinen, N. (Creator), Luoma, V. (Data Collector), Tanhuanpää, T. (Contributor), Kankare, V. (Contributor), Liang, X. (Contributor), Hyyppä, J. (Owner), Holopainen, M. (Funder) & Vastaranta, M. (Contributor),
Open Society Foundations (OSF), 28 Feb 2020

DOI: <https://doi.org/10.31219/osf.io/gz93a>