

## Publications

16 August 2024

Pasi Raumonon

### Peer reviewed scientific journal articles and conference papers:

2024

Montagnoli A, Hudak A T, Raumonon P, Lasserre B, Terzaghi M, Silva C A, Bright B C, Vierling L A , de Vasconcellos B N, Chiatante D, Dumroese R K.

*Terrestrial laser scanning and low magnetic field digitization yield similar architectural coarse root traits for 32-year-old Pinus ponderosa trees.*

Plant Methods, 20, 102 (2024). <https://doi.org/10.1186/s13007-024-01229-9>

Hamberg L, Vanhatalo J, Velmala S, Taylor A, MacKay J, Caron S, Asiegbu F O, Sievänen R, Raumonon P, Hytönen T, Pennanen T.

*The community of root fungi is associated with the growth rate of Norway spruce (Picea abies).*

Environmental Microbiology, 2024;26:e16662, <https://doi.org/10.1111/1462-2920.16662>, jufo 2.

Muumbe T P, Singh J, Baade J, Raumonon P, Coetsee C, Thau C, Schmillius C.

*Individual tree-scale aboveground biomass estimation of woody vegetation in a semi-arid savanna using 3D data.*

Remote Sensing, 2024, 16, 399. <https://doi.org/10.3390/rs16020399>

Sorokina H, Nunes M, Heiskanen J, Munyao M, Mwang'ombe J, Pellikka P, Raumonon, P Maeda E.

*East African megafauna influence on vegetation structure permeates from landscape to tree level scales.*

Ecological Informatics, Volume 79, March 2024, 102435, <https://doi.org/10.1016/j.ecoinf.2023.102435>

Morhart C, Schindler Z, Frey J, Sheppard J P, Calders K, Disney M, Morsdorf F, Raumonon P, Seifert T.

*Limitations of estimating branch volume from terrestrial laser scanning.*

European Journal of Forest Research (2024), <https://doi.org/10.1007/s10342-023-01651-z>

Mönkkönen P, Ali-Löytty S, Raumonon P.

*Monte Carlo Foliage Generation on 3D Tree Models.*

To appear in the proceedings of 22nd ECMI Conference on Industrial and Applied Mathematics, 26-30 June 2023, Wrocław, Poland, 8 pages.

Rahman S M, Mattila H, Eerola L, Mäenpää A, Helminen T, Raumonon P, Kylliäinen A, Virkki J.

*Towards Everyday Physiological Monitoring: A Sock Prototype for Electrodermal Activity Measurements.*

2024 9th International Conference on Smart and Sustainable Technologies (SpliTech). p. 1-6,

<https://doi.org/10.23919/SpliTech61897.2024.10612408>

Musfequr Rahman S M, Mattila H, Shaikh A, Raumonon P, Virkki J.

*An Everyday Hat for Detection of Eye Blinks and Forehead Clenching.*

Proceedings of EMBEC 2024, June 9-13, 2024, Portorož, Slovenia, Volume 1, 112, pp. 67–76, 2024.

[https://doi.org/10.1007/978-3-031-61625-9\\_8](https://doi.org/10.1007/978-3-031-61625-9_8)

Sakif M M, Ihalainen T, Merilampi S, Petäjistö S-M, Raumonon P, Vuohijoki T, Virkki J.

*Enabling Living Spaces Through Customizable NFC-Enabled Smart Table System.*

2024 18th European Conference on Antennas and Propagation (EuCAP), Glasgow, United Kingdom, 2024, pp. 1-5,

<https://doi.org/10.23919/EuCAP60739.2024.10501321>

2023

Nunes M, Vaz M, Camargo J, Laurance W, de Andrade A, Vicentini A, Laurance S, Raumonon P, Jackson T, Zuquim G, Wu J, Penuelas J, Chave J, Maeda E.

*Edge effects on tree architecture exacerbate biomass loss of fragmented Amazonian forests.*

Nature Communications, 14, 8129 (2023). <https://doi.org/10.1038/s41467-023-44004-5>

Su C, Kokosza A, Xie X, Pěňčík A, Zhang Y, Raumonon P, Shi X, Muranen S, Topcu M K, Immanen J, Hagqvist R, Safronov O, Alonso-Serra J, Eswaran G, Venegas M P, Ljung K, Ward S, Mähönen A, Himanen K, Salojärvi J, Fernie A R, Novák O, Leyser O, Paubicki W, Helariutta Y, Nieminen K.

*Tree architecture: A strigolactone-deficient mutant reveals a connection between branching order and auxin gradient along the tree stem*

Proceedings of the National Academy of Sciences of the United States of America, 2023 Vol. 120 No. 48 e2308587120, <https://doi.org/10.1073/pnas.2308587120>

Han T, Raunonen P, Sánchez-Azofeifa G A.

*A non-destructive approach to estimate buttress volume using 3D point cloud data.*

Ecological Informatics, Volume 77, November 2023, 102218. <https://doi.org/10.1016/j.ecoinf.2023.102218>

Greco R, Barca E, Raunonen P, Persia M, Tartarino P.

*Methodology for measuring dendrometric parameters in a mediterranean forest with UAVs flying inside forest.*

International Journal of Applied Earth Observation and Geoinformation, Volume 122, August 2023, 103426.

<https://doi.org/10.1016/j.jag.2023.103426>

Terryn L, Calders K, Åkerblom M, Bartholomeus H, Disney M, Levick S, Origo N, Raunonen P, and Verbeeck H. *Analysing individual 3D tree structure using the R package ITSMe.*

Methods in Ecology and Evolution, 14, 231– 241. <https://doi.org/10.1111/2041-210X.14026>

Rahman, S M M, Shaikh A, Mattila H, Lipping T, Merilampi S, Raunonen P, Virkki J.

*A Hat-Integrated HCI System for Serious Games–Proof-of-Concept Applications in Focus Detection and Game Controlling.*

In: Dondio, P., *et al.* Games and Learning Alliance. GALA 2023. Lecture Notes in Computer Science, vol 14475.

Springer, Cham. [https://doi.org/10.1007/978-3-031-49065-1\\_36](https://doi.org/10.1007/978-3-031-49065-1_36)

## 2022

Calders K, Verbeeck H, Burt A, Origo N, Nightingale J, Malhi Y, Wilkes P, Raunonen P, Bunce R, Disney M.

*Laser scanning reveals potential underestimation of biomass carbon in temperate forest.*

Ecological Solutions and Evidence, 3, e12197. <https://doi.org/10.1002/2688-8319.12197>

Monica Herrero Huerta, Diego Gonzalez Aguilera, Pasi Raunonen.

*4DRoot: root phenotyping software for temporal 3D scans by X-Ray Computed Tomography*

Frontiers in Plant Science, Vol. 13, 2022, <https://doi.org/10.3389/fpls.2022.986856>

Brede B, Terryn L, Barbier N, Bartholomeu H Ms, Bartolo R, Calders K, Derroire G, Krishna Moorthy S, Lau A, Levick S R, Raunonen P, Verbeeck H, Wang D, Whiteside T, van der Zee J, Herold M.

*Non-destructive estimation of individual tree biomass: allometric models, terrestrial and UAV laser scanning.*

Remote Sensing of Environment, Vol 280, October 2022, 113180, <https://doi.org/10.1016/j.rse.2022.113180>

Guzmán E, Fernández M P, Alcalde J-A, Contreras S, Pasi Raunonen P, Picco L, Montalba C, Tejos C.

*Phyllotaxis transition over the lifespan of a palm tree using Magnetic Resonance Imaging (MRI) and Terrestrial Laser Scanning (TLS): the case of *Jubaea chilensis*.*

Plant Methods, 18, 88 (2022). <https://doi.org/10.1186/s13007-022-00920-z>

Maeda E, Nunes M, Calders K, Mendes de Moura Y, Raunonen P, Tuomisto H, Verley P, Vincent G, Zuquim G, Camargo J L.

*Shifts in structural diversity of Amazonian forest edges detected using terrestrial laser scanning.*

Remote Sensing of Environment, Vol 271, 15 March 2022, 112895, <https://doi.org/10.1016/j.rse.2022.112895>

Demol M, Wilkes P, Raunonen P, Krishna Moorthy S, Calders K, Gielen B, Verbeeck H.

*Volumetric overestimation of small branches in 3D reconstructions of *Fraxinus excelsior*.*

Silva Fennica, vol. 56 no. 1 article id 10550, <https://doi.org/10.14214/sf.10550>

Ivanov P, Nurminen H, Ali-Löytty S, Raunonen P.

*Wi-Fi Node Location Estimation Based on GNSS and Motion Sensor Data*

ICL-GNSS 2022 WiP Proceedings, co-located with 12th International Conference on Localization and GNSS (2022).

Tampere, Finland, June 07-09, 2022.

## 2021

O’Sullivan H, Raunonen P, Kaitaniemi P, Perttunen J, Sievänen R.

*Integrating terrestrial laser scanning with functional-structural plant models to investigate ecological and evolutionary processes of forest communities.*

Annals of Botany, 2021, mcab120, <https://doi.org/10.1093/aob/mcab120>

Martin-Ducup O, II Mofack G, Wang D, Raunonen P, Ploton P, Sonké B, Barbier N, Couteron P, Pélissier R. *Evaluation of automated pipelines for tree and plot metric estimation from TLS data in tropical forest areas.* Annals of Botany, mcab051, <https://doi.org/10.1093/aob/mcab051>

Beyer R M, Basler D, Raunonen P, Kaasalainen M, Pretzsch H. *Do trees have constant branch divergence angles?* Journal of Theoretical Biology, Volume 512, 7 March 2021, 110567, <https://doi.org/10.1016/j.jtbi.2020.110567>

Pitkänen T, Raunonen P, Liang X, Lehtomäki M, Kangas A. *Improving TLS-based stem volume estimates by field measurements.* Computers and Electronics in Agriculture, Volume 180, January 2021, 105882, <https://doi.org/10.1016/j.compag.2020.105882>

Brede, B., Barbier, N., Bartholomeus, H., Bartolo, R., Calders, K., Derroire, G., Lau, A., Levick, S., Moorthy, S. M. K., Raunonen, P., Terry, L., Verbeeck, H., Whiteside, T., & Herold, M. *UAV-Laser Scanning based Metrics for Individual Tree Volume Estimation across Forest Types.* In Proceedings of the SilviLaser Conference 2021 (pp. 68–70). <https://doi.org/10.34726/wim.1918>

Calders, K., Newnham, G., Boer, M., Disney, M., Ellsworth, D., Herold, M., Medlyn, B., Phinn, S., Raunonen, P., Scarth, P., Wu, D., Hickson, J., & Verbeeck, H. *Quantifying forest dynamics in a free-air CO<sub>2</sub> enrichment experiment using terrestrial laser scanning.* In Proceedings of the SilviLaser Conference 2021 (pp. 16–18). <https://doi.org/10.34726/wim.1901>

Verhoeven V, Åkerblom M, Raunonen P. *Quantifying TLS Data and Diameter Estimation Uncertainty* In Proceedings of the SilviLaser Conference 2021(pp. 111–113). <https://doi.org/10.34726/wim.1933>

Raunonen P, Brede B, Lau L, Bartholomeus H. *A Shortest Path Based Tree Isolation Method For Uav Lidar Data.* 2021 IEEE International Geoscience and Remote Sensing Symposium IGARSS, 2021, pp. 724-727, <https://doi.org/10.1109/IGARSS47720.2021.9554346>

## 2020

He, H.; Chen, X.; Mehmood, A.; Raivio, L.; Huttunen, H.; Raunonen, P.; Virkki, J. *ClothFace: A Batteryless RFID-Based Textile Platform for Handwriting Recognition.* Sensors, 2020, 20, 4878. <https://doi.org/10.3390/s20174878>

Terry L, Calders K, Disney M, Origo N, Malhi Y, Newnham G, Raunonen P, Åkerblom M, Verbeeck M. *Tree species classification using structural features derived from terrestrial laser scanning.* ISPRS Journal of Photogrammetry and Remote Sensing, 168, October 2020, pp. 170–181. <https://doi.org/10.1016/j.isprsjprs.2020.08.009>

Krishna Moorthy S M, Raunonen P, den Bulcke J V, Calders K, Verbeeck H. *Terrestrial laser scanning for non-destructive estimates of liana stem biomass.* Forest Ecology and Management, Volume 456, 15 January 2020, 117751, 14p, <https://doi.org/10.1016/j.foreco.2019.117751>

Marzulli M, Raunonen P, Greco R, Persia M, Tartarino P. *Estimating tree stem diameters and volume from smartphone photogrammetric point clouds.* Forestry: An International Journal of Forest Research, 2020; **00**, 1–19, <https://doi.org/10.1093/forestry/cpz067>

## 2019

Kunz M, Fichtner A, Härdtle W, Raunonen P, Bruehlheide H, von Oheimb G. *Neighbour species richness and local structural variability modulate aboveground allocation patterns and crown morphology of individual trees.* Ecology Letters, Volume 22, Issue 12, December 2019, pp. 2130-2140, <https://doi.org/10.1111/ele.13400>

Brede B, Calders K, Lau A, Raunonen P, Bartholomeus H M, Herold M, Kooistra L. *Non-destructive Tree Volume Estimation through Quantitative Structure Modelling: Comparing UAV Laser Scanning with Terrestrial Lidar.* Remote Sensing of Environment, Volume 233, November 2019, 111355, <https://doi.org/10.1016/j.rse.2019.111355>

- Liu W, Atherton J, Möttus M, Gastellu-Etchegorry J-P, Malenovský Z, Raunonen P, Åkerblom M, Mäkipää R, Porcar-Castell A.  
*Simulating solar-induced chlorophyll fluorescence in a boreal forest stand reconstructed from terrestrial laser scanning measurements.*  
Remote Sensing of Environment, Volume 232, October 2019, 111274, <https://doi.org/10.1016/j.rse.2019.111274>
- Lau A, Calders K, Bartholomeus H, Martius C, Raunonen P, Herold M, Vicari M, Sukhdeo H, Singh J, Goodman RC.  
*Tree Biomass Equations from Terrestrial LiDAR: A Case Study in Guyana.*  
Forests, Volume: 10 Issue: 6, <https://doi.org/10.3390/f10060527>
- Jackson T, Shenkin A, Moore J, Bunce A, van Emmerik T, Kane B, Burcham D, James K, Selker J, Calders K, Origo N, Disney M, Burt A, Wilkes P, Raunonen P, Gonzalez de Tanago Menaca J, Lau A, Herold M, Goodman R C, Fourcaud T and Malhi Y.  
*An architectural understanding of natural sway frequencies in trees.*  
Journal of Royal Society Interface 16: 20190116. <http://dx.doi.org/10.1098/rsif.2019.0116>
- Jackson T, Shenkin A, Kalyan B, Zionts J, Calders K, Origo N, Disney M, Burt A, Raunonen P, Malhi Y.  
*A new architectural perspective on wind damage in a natural forest.*  
Frontiers in Forests and Global Change, January 2019, Volume 1, Article 13, 10 pages,  
<https://doi.org/10.3389/ffgc.2018.00013>
- Pitkänen T, Raunonen P, Kangas A.  
*Measuring stem diameters with TLS in boreal forests by complementary fitting procedure.*  
ISPRS Journal of Photogrammetry and Remote Sensing, Volume 147, January 2019, Pages 294-306,  
<https://doi.org/10.1016/j.isprsjprs.2018.11.027>
- Jackson T, Shenkin A, Wellpott A, Calders K, Origo N, Disney M, Burt A, Raunonen P, Gardiner B, Herold M, Fourcaud T, Malhi Y.  
*Finite element analysis of trees in the wind based on terrestrial laser scanning data.*  
Agricultural and Forest Meteorology, Volume 265, 2019, Pages 137-144,  
<https://doi.org/10.1016/j.agrformet.2018.11.014>
- 2018**
- Calders K, Origo N, Burt A, Disney M, Nightingale J, Raunonen P, Åkerblom M, Malhi Y, Lewis P.  
*Realistic Forest Stand Reconstruction from Terrestrial LiDAR for Radiative Transfer Modelling.*  
Remote Sensing, 10(6):933, <https://doi.org/10.3390/rs10060933>
- Raunonen P, Tarvainen T.  
*Segmentation of vessel structures from photoacoustic images with reliability assessment.*  
Biomedical Optics Express, Vol. 9, Issue 7, pp. 2887-2904, <https://doi.org/10.1364/BOE.9.002887>
- Sievänen R, Raunonen P, Perttunen J, Nikinmaa E, Kaitaniemi P.  
*A study of crown development mechanisms using a shoot-based tree model and segmented terrestrial laser scanning data.*  
Annals of Botany, Volume 122, Issue 3, 27 August 2018, Pages 423–434, <https://doi.org/10.1093/aob/mcy082>
- Lau A, Bentley P L, Martius C, Bartholomeus H, Shenkin A, Raunonen P, Malhi Y, Jackson T, Herold M.  
*Quantifying branch architecture of tropical trees using terrestrial LiDAR and 3D modelling.*  
Trees, October 2018, Volume 32, Issue 5, pp 1219–1231, <https://doi.org/10.1007/s00468-018-1704-1>
- Åkerblom A, Raunonen P, Casella E, Disney M, Danson M, Gaulton R, Schofield L, Kaasalainen M.  
*Non-Intersecting Leaf Insertion Algorithm for Tree Structure Models.*  
Interface Focus 8: 20170045. <http://dx.doi.org/10.1098/rsfs.2017.0045>
- Disney M, Boni Vicari M, Burt A, Calders K, Lewis S, Raunonen P, Wilkes P.  
*Weighing trees with lasers: advances, challenges and opportunities.*  
Interface Focus 8: 20170048. <http://dx.doi.org/10.1098/rsfs.2017.0048>
- Gonzalez de Tanago Menaca J, Lau A, Bartholomeus H, Herold M, Avitabile V, Raunonen P, Martius C, Goodman R, Disney M, Manuri S, Burt A, Calders K.  
*Estimation of above-ground biomass of large tropical trees with Terrestrial LiDAR.*  
Methods in Ecology and Evolution, Vol. 9, Issue 2, pp. 223-234, <https://doi.org/10.1111/2041-210X.12904>

## 2017

Åkerblom M, Raunonen P, Mäkipää R, Kaasalainen M.

*Automatic tree species recognition with quantitative structure models.*

Remote Sensing of Environment, Vol. 191, 1-12, <https://doi.org/10.1016/j.rse.2016.12.002>

Kunz M, Hess C, Raunonen P, Bienert A, Hackenberg J, Maas H-G, Härdtle W, Fichtner A, Von Oheimb G.

*Comparison of wood volume estimates of young trees from terrestrial laser scan data*

iForest 10: 451-458, <https://doi.org/10.3832/ifor2151-010>

Juchheim J, Annighöfer P, Ammer C, Calders K, Raunonen P, Seidel D.

*How management intensity and neighborhood composition affect the structure of beech (*Fagus sylvatica* L.) trees.*

Trees - Structure and Function, Volume 31, Issue 5, pp 1723–1735, <https://doi.org/10.1007/s00468-017-1581-z>

Saarela S, Breidenbach J, Raunonen P, Grafström A, Ståhl G, Ducey M J, Astrup R.

*Kriging prediction of stand level forest information using mobile laser scanning data adjusted for non-detection.*

Canadian Journal of Forest Research, Vol. 47, No. 9, pp. 1257-1265, <https://doi.org/10.1139/cjfr-2017-0019>

Potapov I, Järvenpää M, Åkerblom M, Raunonen P, Kaasalainen M.

*Bayes Forest: a data-intensive generator of morphological tree clones.*

GigaScience, Vol. 6, Issue 10, Pages 1–13, gix079, <https://doi.org/10.1093/gigascience/gix079>

Chen X, He H, Chen L, Raunonen P, Ukkonen L, Virkki J.

*Two-part Stretchable Passive UHF RFID Textile Tags.*

Proceedings of 2017 Progress In Electromagnetics Research Symposium - Spring (PIERS), St Petersburg, Russia, 22–25 May, pp. 3318-3321.

Mulholland K, Virkki J, Raunonen P, Merilampi S.

*Wearable RFID perspiration sensor tags for well-being applications – from laboratory to field use.*

In: Eskola H., Väisänen O., Viik J., Hyttinen J. (eds) EMBEC & NBC 2017. EMBEC 2017, NBC 2017. IFMBE Proceedings, Vol 65. Springer, Singapore, pp. 1012-1015.

Merilampi S, Koivisto A, Sirkka A, Raunonen P, Virkki J.

*The Cognitive Mobile Games for Older Adults - A Chinese User Experience Study.*

2017 IEEE 5th International Conference on Serious Games and Applications for Health, SeGAH 2017, 5 June 2017, Article number 79392805th IEEE International Conference on Serious Games and Applications for Health, SeGAH 2017; Perth; Australia; 2 April 2017 through 4 April 2017; Category number CFP17SEG-ART; Code 128206

## 2016

Painter I, Saenz E, Genest D, Peri F, Erb A, Li Z, Wiggins K, Muir J, Raunonen P, Schaaf E, Strahler A & Schaaf C.

*Observing ecosystems with lightweight, rapid-scanning terrestrial lidar scanners.*

Remote Sensing in Ecology and Conservation, 2: 174–189, <https://doi.org/10.1002/rse2.26>

Potapov I, Järvenpää M, Åkerblom M, Raunonen P, Kaasalainen M.

*Data-based stochastic modeling of tree growth and structure formation.*

Silva Fennica, Vol. 50, No. 1, article id 1413, <https://doi.org/10.14214/sf.1413>

Raunonen P, Ideguchi Y, Uranishi Y, Åkerblom M, Kaasalainen M, Yoshimoto S, Kuroda Y, Oshiro O.

*Virtual Reality Forest: Realistic Trees Based on Laser Scans.*

Proceedings of EuroVR 2016, Athens, Greece, 22-24 November 2016, 5 pages.

Calders K, Burt A, Origo N, Disney M, Nightingale J, Raunonen P & Lewis P.

*Large-area virtual forests from terrestrial laser scanning data.*

IEEE International Geoscience and Remote Sensing Symposium (IGARSS), 10-15 July 2016, p. 1765-1767.

## 2015

Hackenberg J, Spiecker H, Calders K, Disney M, Raunonen P.

*SimpleTree — An Efficient Open Source Tool to Build Tree Models from TLS Clouds.*

Forests, Vol. 6, No. 11, 4245-4294, <https://doi.org/10.3390/f6114245>

Calders K, Newnham G, Burt A, Murphy S, Raunonen P, Herold M, Culvenor D, Avitabile V, Disney M, Armston J, Kaasalainen M.

*Non-destructive estimates of above-ground biomass using terrestrial laser scanning.*

Methods in Ecology and Evolution, Vol. 6, No. 2, pp. 198-208, <https://doi.org/10.1111/2041-210X.12301>

Raumonen P, Casella E, Calders K, Murphy S, Åkerblom M, Kaasalainen M.  
*Massive-scale Tree Modelling from TLS Data.*  
ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume II-3/W4, 189-196.  
PIA15+HRIGI15 – Joint ISPRS conference 2015, 25–27 March 2015, Munich, Germany,  
<https://doi.org/10.5194/isprsannals-II-3-W4-189-2015>

Åkerblom M, Raumonen P, Kaasalainen M, Casella E.  
*Analysis of geometric primitives in quantitative structure models of tree stems.*  
Remote Sensing, 7, 4581-4603; <https://doi.org/10.3390/rs70404581>

Raumonen P.  
*Quantitative structure tree models from terrestrial laser scanner data.*  
Proc. of Silvilaser 2015, La Grande Motte, France, September 28-30, pp. 32-34.

Lau Sarmiento A, Bartholomeus H, Herold M, Martius C, Malhi Y, Patrick Bentley L, Shenkin A, Raumonen P.  
*Application of terrestrial LiDAR and modelling of tree branching structure for plant- scaling models in tropical forest trees.*  
Proc. of Silvilaser 2015, La Grande Motte, France, September 28-30, pp. 96-98.

Gonzalez de Tanago J, Bartholomeus H, Joseph S, Herold M, Avitabile V, Goodman R, Raumonen P, Burt A.  
*Terrestrial LiDAR and 3D tree Quantitative Structure Model for quantification of aboveground biomass loss from selective logging in a tropical rainforest of Peru*  
Proc. of Silvilaser 2015, La Grande Motte, France, September 28-30, pp. 119-121.

Calders K, Disney M, Nightingale J, Origo N, Barker A, Raumonen P, Lewis P, Burt A, Brennan J, Fox N.  
*Traceability of essential climate variables through forest stand reconstruction with terrestrial laser scanning.*  
Proc. of Silvilaser 2015, La Grande Motte, France, September 28-30, pp. 122-124.

Calders K, Burt A, Newnham G, Disney M, Murphy S, Raumonen P, Herold M, Culvenor D, Armston A, Avitabile V, Kaasalainen M.  
*Reducing uncertainties in above-ground biomass estimates using terrestrial laser scanning.*  
Proc. of Silvilaser 2015, La Grande Motte, France, September 28-30, pp. 197-199.

## 2014

Liski J, Kaasalainen S, Raumonen P, Akujärvi A, Krooks A, Repo A, Kaasalainen M.  
*Indirect emissions of forest bioenergy: detailed modeling of stump-root systems.*  
Global Change Biology Bioenergy, Vol. 6, No. 6, pp. 777-784, <https://doi.org/10.1111/gcbb.12091>

Smith A, Astrup R, Raumonen P, Liski J, Krooks A, Kaasalainen S, Åkerblom M, Kaasalainen M.  
*Tree Root system characterization and volume estimation by terrestrial laser scanning.*  
Forests, Vol. 5, No. 12, pp. 3274-3294, <https://doi.org/10.3390/f5123274>

Janka M, Saukko E, Raumonen P, Lupo D.  
*Optimization of large-area OLED current distribution grids with self-aligned passivation.*  
Organic Electronics, Vol. 15, No. 12, pp. 3431–3438, <https://doi.org/10.1016/j.orgel.2014.09.028>

Krooks A, Kaasalainen S, Kankare V, Joensuu M, Raumonen P, Kaasalainen M.  
*Predicting tree structure from tree height using terrestrial laser scanning and quantitative structure models.*  
Silva Fennica, Vol. 48, No. 2, Article Id 1125, <https://doi.org/10.14214/sf.1125>

Kaasalainen S, Krooks A, Liski J, Raumonen P, Kaartinen H, Kaasalainen M, Puttonen E, Anttila K, Mäkipää R.  
*Change Detection of Tree Biomass with Terrestrial Laser Scanning and Quantitative Structure Modelling.*  
Remote Sensing, Vol. 6, No. 5, pp. 3906-3922, <https://doi.org/10.3390/rs6053906>

Gonzalez de Tanago J, Joseph J, Herold M, Goodman R, Avitabile V, Bartholomeus H, Raumonen P, Calders K, Lau Sarmiento A, and Janovec J.  
*Terrestrial LiDAR and 3D tree reconstruction modeling for quantification of biomass loss and characterization of impacts of selective logging in tropical forest of Peruvian Amazon.*  
ForestSAT2014, 4-7 Nov. 2014, Riva del Garda, Italy.

Janka M, Raumonen P, Tuukkanen S, Lupo D.  
*Modelling of Joule heating based self-alignment method for metal grid line passivation.*

Materials Research Society Symposium Proceedings, Vol. 1628 / 2014.

## 2013

Raunonen P, Kaasalainen M, Åkerblom M, Kaasalainen S, Kaartinen H, Vastaranta M, Holopainen M, Disney M, Lewis P.

*Fast Automatic Precision Tree Models from Terrestrial Laser Scanner Data.*

Remote Sensing, Vol. 5, No. 2, pp. 491-520, <https://doi.org/10.3390/rs5020491>

Virkki J, Raunonen P.

*Perspectives for Wearable Electronics in Healthcare and Childcare.*

E-Health Telecommunication Systems and Networks, Vol. 2, No. 3, pp. 58-63,

<http://dx.doi.org/10.4236/etsn.2013.23008>

Stenvall A, Tarhasaari T, Grilli F, Raunonen P, Vojenciak M, Pellikka M.

*Manifolds in electromagnetism and superconductor modelling: using their properties to model critical current of twisted conductors in self-field with 2-D model.*

Cryogenics, Vol. 53, Special issue SI, pp. 135–141, <https://doi.org/10.1016/j.cryogenics.2012.06.005>

Raunonen P, Casella E, Disney M, Åkerblom M, Kaasalainen M.

*Fast automatic method for constructing topologically and geometrically precise tree models from TLS Data.*

Proc. of FSPM 2013, Saariselkä, Finland, 9-14 Jun. 2013, pp. 89-91.

Kaasalainen M, Potapov I, Raunonen P, Åkerblom M, Sievänen R, Kaasalainen S.

*Bayes trees and forests: combining precise empirical and theoretical tree models.*

Proc. of FSPM 2013, Saariselkä, Finland, 9-14 Jun. 2013, pp. 61-63.

Burt A, Disney M, Raunonen P, Armston J, Calders K, Lewis P.

*Rapid Characterisation of Forest Structure from TLS and 3D Modelling.*

Proc. of IGARSS 2013, Melbourne, Australia, 21-26 Jul. 2013, 4 p.

Calders K, Newnham G, Herold M, Murphy S, Culvenor D, Raunonen P, Burt A, Armston J, Avitabile V, Disney M.

*Estimating above ground biomass from terrestrial laser scanning in Australian Eucalypt Open Forest.*

Proc. of Silvilaser 2013, Beijing, China, 9-11 Oct. 2013, 7 p.

## 2012

Disney M, Lewis P, Raunonen P.

*Testing a new vegetation structure retrieval algorithm from terrestrial lidar scanner data using 3D models.*

Proc. of SilviLaser 2012, Vancouver, Canada, 16-19 Sep. 2012, 9 p.

Åkerblom M, Raunonen P, Kaasalainen M, Kaasalainen S, Kaartinen H.

*Comprehensive quantitative tree models from TLS data.*

Proc. of IEEE International Geoscience and Remote Sensing Society Symposium,

Hamburg, Germany, 23-27 July 2012, 4 p.

## 2011

Raunonen P, Kaasalainen S, Kaasalainen M, Kaartinen H.

*Approximation of volume and branch size distribution of trees from laser scanner data.*

International Archives of Photogrammetry, Remote Sensing and Spatial Sciences, Vol. 38(5/W12), 6 p.

<https://doi.org/10.5194/isprsarchives-XXXVIII-5-W12-79-2011>

Raunonen P, Suuriniemi S, Kettunen L.

*Dimensional Reduction of Electromagnetic Boundary Value Problems.*

Boundary Value Problems 2011, 2011:9. <https://doi.org/10.1186/1687-2770-2011-9>

Virkki J. & Raunonen P.

*Testing the Effects of Seacoast Atmosphere on Tantalum Capacitors.*

Active and Passive Electronic Components, Vol. 2011, Article ID 108423, 9 pages.

<https://doi.org/10.1155/2011/108423>

Virkki J, Raunonen P, Sydänheimo L.

*Modifications of the 85/85 Test and the Temperature Cycling Test for Tantalum Capacitors.*

Soldering & Surface Mount Technology, Vol. 23, No. 3, 2011, pp. 168 - 176.

<https://doi.org/10.1108/0954091111146926>

## 2010

Calvano F, Raunonen P, Suuriniemi S, Kettunen L, Rubinacci G.

*Size Is in the Eye of the Beholder: Technique for Non-destructive Detection of Parameterized Defects.*

IEEE Transaction on Magnetics, Vol. 46, No. 8, pp. 3006-3009. DOI: <https://doi.org/10.1109/TMAG.2010.2044564>

Virkki J. & Raunonen P.

*Accelerated Tests for the Effects of Power Cycling on Tantalum Capacitors in a Humid Environment.*

Journal of Microelectronics and Electronic Packaging. Vol. 7, No. 2, pp. 111-116.

<https://doi.org/10.4071/1551-4897-7.2.111>

Virkki J, Seppälä T, Raunonen P.

*Testing the Effects of Reflow on Tantalum Capacitors.*

Microelectronics Reliability, Vol. 50, No. 9-11, pp. 1650-1653. <https://doi.org/10.1016/j.microrel.2010.07.055>

## 2009

Raunonen P, Suuriniemi S, Kettunen L.

*Parametric models in quasi-static electromagnetics.*

IEEE Transactions on Magnetics, Vol. 45, No. 3, pp. 944-947. <https://doi.org/10.1109/TMAG.2009.2012476>

## 2008

Raunonen P, Suuriniemi S, Kettunen L.

*Applications of manifolds: mesh generation.*

IET Science, Measurement & Technology, Vol. 2, No. 5, pp. 286-294. <https://doi.org/10.1049/iet-smt:20070101>

Raunonen P, Suuriniemi S, Tarhasaari T, Kettunen L.

*Dimensional reduction in electromagnetic boundary value problems.*

IEEE Transactions on Magnetics, Vol. 44, No. 6, pp. 1146-1149. <https://doi.org/10.1109/TMAG.2007.916657>

## 2006

Raunonen P, Suuriniemi S, Kettunen L.

*Coordinate systems are not canonical: applications in mesh generation.*

Proc. of the 12th International IGTE Symposium on Numerical Field Calculation in Electrical Engineering, Graz, Austria, Sept. 18-20, 2006, pp. 180-185.

## 2004

Raunonen P, Keskilammi M, Sydänheimo L, Kivikoski M.

*A very low profile CP EBG antenna for RFID reader.*

Proc. of Antennas and Propagation Society International Symposium, 20.-25.7. 2004. IEEE, Vol. 4, pp. 3808-3811.

## 2003

Raunonen P, Sydänheimo L, Ukkonen L, Keskilammi M, Kivikoski M.

*Folded dipole antenna near metal plate.*

Proc. of Antennas and Propagation Society International Symposium, 22.-27.7. 2003. IEEE, Vol. 1, pp. 848-851.

<https://doi.org/10.1109/APS.2003.1217593>

Raunonen P, Salonen P, Ukkonen L, Sydänheimo L, Kivikoski M.

*Folded Dipole Antenna Above EBG Surface.*

Proc. of USNC/CNC/URSI North American Radio Science Meeting, Columbus, OH, June 22-27, 2003.

Ukkonen L, Ali-Rantala P, Raunonen P, Sydänheimo L, Kivikoski M.

*Modelling and Comparison of the Propagation of 433 MHz, 868 MHz, 2.4 GHz and 5.0 GHz Electromagnetic Waves within a Simulation Construction.*

Proc. of USNC/CNC/URSI North American Radio Science Meeting, Columbus, OH, June 22-27, 2003.

## Peer reviewed scientific conference abstracts:

### 2023

Muumbe T P, Singh J, Thau C, Baade J, Raunonen P, Coetsee C, Schullius C.

*Quantifying Savanna Tree Above Ground Biomass Change by Utilizing Multi-temporal TLS Data Sets.*

Silvilaser 2023, 6-8 Sep 2023, London, UK.



Singh P, Raumonen P.

*Semantic Segmentation of Lidar data using 3D U-Net with dynamic training and multi-feature channels.*

Silvilaser 2023, 6-8 Sep 2023, London, UK.

Mönkkönen P, Ali-Löytty S, Raumonen P.

*Foliage Generation on Quantitative Structure Models with User Given Leaf Distributions.*

Silvilaser 2023, 6-8 Sep 2023, London, UK.

Verhoeven V, Raumonen P, Åkerblom M.

*Fitting Cylinders to Uncertain Laser Scanning Data.*

Silvilaser 2023, 6-8 Sep 2023, London, UK.

Cooper Z T, Cherlet W, Demol M, Verbeeck H, Raumonen P, Van den Broeck W, Calders K.

*Validation of Quantitative Structure Models Against Destructively Sampled Trees.*

Silvilaser 2023, 6-8 Sep 2023, London, UK.

MacFarlane D W, Morales A, Calders K, Raumonen P.

*Differences in tree stem and branch volume and biomass estimation accuracy arising from different versions of TreeQSM: implications for corrective measures and alternative approaches.*

Silvilaser 2023, 6-8 Sep 2023, London, UK.

Arseniou G, MacFarlane D, Raumonen P.

*Using terrestrial laser scanning technology to estimate the aboveground heartwood-sapwood volume proportion of trees.*

Silvilaser 2023, 6-8 Sep 2023, London, UK.

## 2016

Calders K, Burt A, Origo N, Disney M, Nightingale J, Raumonen P, Lewis P, Brennan J.

*Constructing a large area virtual validation forest stand from terrestrial LiDAR.*

Living Planet Symposium 2016, Prague, Czech Republic, 9-13 May 2016, paper 702.

Lau Sarmiento A, Bartholomeus H, Herold M, Martius C, Malhi Y, Bentley L P, Shenkin A, Raumonen P.

*Application of Terrestrial LiDAR and Modelling of Tree Branching Structure for Plant-scaling Models in Tropical Forest Trees.*

Living Planet Symposium 2016, Prague, Czech Republic, 9-13 May 2016, paper 1134.

Gonzalez de Tanago J, Lau Sarmiento A, Bartholomeus H, Herold M, Raumonen P, Avitabile V, Martius C, Joseph Shijo.

*Quantification of Tropical Forest Biomass with Terrestrial LiDAR and 3D Tree Quantitative Structure Modelling.*

Living Planet Symposium 2016, Prague, Czech Republic, 9-13 May 2016, paper 2609.

Disney M, Burt A, Calders K, Raumonen P, Herold M, Lewis P, Lewis S, Boni Vicari M, Rowland L, Meir P, Mitchard E.

*3D Measurements of Tropical Forest Structure for BIOMASS, Morphology and Calibration and Validation of Satellite Observations.*

Living Planet Symposium 2016, Prague, Czech Republic, 9-13 May 2016, paper 1091.

## 2012

Krooks A, Kaasalainen S, Raumonen P, Kaasalainen M, Kaartinen H, Kukko A, Puttonen E, Liski J, Holopainen M, Vastaranta M.

*Branch growth and tree change detection using terrestrial laser scanning.*

SilviLaser 2012, Vancouver, Canada, 16-19 Sep. 2012.

Raumonen P, Åkerblom M, Kaasalainen M.

*A Method for Reconstructing Cylinder Model of a Single Tree from Terrestrial Laser Scanner Data.*

32nd EARSeL Symposium 2012, Mykonos, Greece, 21-24 May 2012.

Raumonen P.

*Quantitative 3D tree models from point cloud data.*

The 6<sup>th</sup> International Conference on Inverse Problems and Related Topics, October 2012, Nanjing, China.

## 2011

Raumonen P, Kaasalainen M, Kaasalainen S, Kaartinen H.

*Approximation of volume and branch size distribution of trees from laser scanner data.*  
European Geosciences Union General Assembly 2011, Vienna, Austria, 03 - 08 April 2011.

Kaasalainen M, Raumonon P, Kaasalainen S, Kaartinen H.  
*Measuring and computing tree branch structure and size distribution from terrestrial laser scanner data.*  
Proc. of 1st Forestry Workshop: Operational Remote Sensing in Forest Management, Prague, Czech Republic, 02 - 03 June 2011.

#### **2007**

Raumonon P, Suuriniemi S, Tarhasaari T, Kettunen L.  
*Reduction of domain dimension in electromagnetic boundary value problems by symmetry.*  
Proc. of the 16th Conference on the Computation of Electromagnetic Fields,  
June 24-28, 2007, Aachen, Germany, pp. 991-992.

#### **2003**

Ukkonen L, Raumonon P, Keskilammi M, Sydänheimo L, Kivikoski M.  
*Challenges in the Development of Tag Antennas for Passive RFID of Metallic Objects.*  
Salonen, E, Juntti. M, Saarnisaari, H, Heikkinen. P. (eds.). XXVIII Convention on Radio Science & IV Finnish Wireless Communication Workshop, University of Oulu, October 16-17, 2003.

### **Not peer reviewed scientific articles:**

John Hom, Yong Pang, Dan Zhao, Guangcai Xu, Anssi Krooks, Pasi Raumonon, Mikko Kaasalainen, Jonathan Dandois, Kenneth Clark, Nick Skowronski, Matthew Patterson, Michael Gallagher (2013).  
*Characterization of fuel structure and estimations of biomass using 3D terrestrial laser scanning.*  
Proc. Of Fourth Fire Behavior and Fuels, Raleigh, North Carolina, USA, February 18 -22, 2013

Raumonon P, Suuriniemi S, Tarhasaari T, Kettunen L. (2007)  
*Manifold and metric in numerical solution of the quasi-static electromagnetic boundary value problems.*  
arXiv.org, Mathematical Physics, 9.10.2007, 25 pages.

Raumonon P. & Suuriniemi S. (2006)  
*Koordinaatistot joustaviksi verkon generoinnissa.*  
Viljanen, A. (toim.). Sähkömagnetiikka 2006, Tiivistelmät - Abstracts. Ilmatieteen laitos, Raportteja.

Raumonon P, Suuriniemi S, Kettunen L. (2006)  
*Metriikka ja kartat elementtimenetelmässä.*  
Matematiikan päivät 2006, Tampere, 4.-5.1.2006.

### **Scientific books:**

Raumonon P. (2009)  
*Mathematical structures for dimensional reduction and equivalence classification of electromagnetic boundary value problems.*  
Tampere University of Technology, Ph.D. Thesis, Publication 811, 188 pages.

### **Publications intended for professional communities:**

Raumonon P, Keskilammi M, Sydänheimo L, Kivikoski M. (2003)  
*Antennien miniaturisointi.*  
Prosessori, ES marraskuu 2003, pp. 46-47.

### **Theses:**

Raumonon P. (2009)  
*Mathematical structures for dimensional reduction and equivalence classification of electromagnetic boundary value problems.*  
Tampere University of Technology, Ph.D. Thesis, Publication 811, 188 pages.

Raumonon, P. (2004)  
*Development of Microwave Antennas Using EBG Structures.*

