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LIST OF PUBLICATIONS

A. Peer-reviewed scientific articles

A.1 Journal articles

1. P. Kuusela, A. Seppänen: "A coupled, double layer electrical impedance tomography -based sensing skin for pressure and leak detection", *Sensors*, 24: 4134, 2024.
2. M. Räsänen, P. Kuusela, J. Jauhiainen, M. Arif, K. Scheel, T. Savolainen, A. Seppänen: "Kuopio Tomography Challenge 2023 – electrical impedance tomography competition and open dataset", *Applied Mathematics for Modern Challenges*, 2: 93-118, 2024.
3. A. Voss, E. Vänskä, D Weidmann, A. Pulkkinen, A. Seppänen: "Multi-open-path laser dispersion spectroscopy combined with Bayesian state estimation for localizing and quantifying methane emissions", *Atmospheric Environment: X*, 22: 100260, 2024.
4. S. Suominen, T. Hyypijev, M. Venäläinen, A. Yrjänäinen, H. Vuorenpää, M. Lehti-Polojärvi, M. Räsänen, A. Seppänen, J. Hyttinen, S. Miettinen, K. Aalto-Setälä, L. E. Viiri: "Improvements in maturity and stability of 3D iPSC-derived hepatocyte-like cell cultures", *Cells*, 12: 236, 2023.
5. T. Salminen, K.E.J. Lehtinen, A. Seppänen: "Application of the finite element method to the multicomponent General Dynamic Equation of Aerosols", *Journal of Aerosol Science*, 174: 106260, 2023.
6. M. Ziaul Arif, A. Seppänen, M. Vauhkonen: "State estimation approach to dual-modal imaging of two-phase flow based on electromagnetic flow tomography and electrical tomography", *Inverse Problems*, 39: 084003 (24pp), 2023.
7. M. Ziaul Arif, A. Seppänen, V. Kolehmainen, M. Vauhkonen: "Dual-Modal Electrical Imaging of Two-Phase Flow – Experimental Evaluation of the State Estimation Approach", *Sensors*, 70: 1010017, 2023.
8. L.E. Dalton, M. Räsänen, A. Voss, A. Seppänen, M. Pourghaz: "Investigating the Use of Electrical Capacitance Tomography to Image Rapid Transient Moisture Flow Through Cracks in Concrete", *Cement and Concrete Composites*, 140: 105070, 2023.
9. T. Ojala, H. Ahmed, P. Kuusela, A. Seppänen, J. Punkki: "Monitoring of concrete segregation using AC impedance spectroscopy", *Construction and Building Materials*, 384: 131453, 2023.

10. J. Jauhiainen, A. Seppänen, T. Valkonen: "Mumford-Shah regularization in electrical impedance tomography with complete electrode model", *Inverse Problems*, 38: 065004 (35pp), 2022.
11. K. Kansanen, P. Packalen, T. Lähivaara, A. Seppänen, J. Vauhkonen, M. Maltamo, L. Mehtätalo: "Evaluating a Horvitz-Thompson-like stand density estimator in individual tree detection following aerial laser scanning", *Canadian Journal of Forest Research*, 52: 527-538, 2022.
12. T. Salminen, K.E.J. Lehtinen, J.P. Kaipio, V. Russell, A. Seppänen: "Application of finite element method to General Dynamic Equation of Aerosols - comparison with classical numerical approximations", *Journal of Aerosol Science*, 160: 105902, 2022.
13. M. Ziaul Arif, O. Lehtikangas, A. Seppänen, V. Kolehmainen, M. Vauhkonen: "Joint reconstruction of conductivity and velocity in two-phase flows using electromagnetic flow tomography and electrical tomography", *IEEE Transactions on Instrumentation & Measurement*, 70, pp. 1-17, Art no. 1010017, doi: 10.1109/TIM.2021.3117365, 2021.
14. M. Lehti-Polojärvi, M. Räsänen, L. Viiri, H. Vuorenpää, S. Miettinen, A. Seppänen, J. Hyttinen: "Retrieval of the Conductivity Spectrum of Tissues in-vitro with Novel Multimodal Tomography", *Physics in Medicine & Biology*, 66: 205016, 2021.
15. P. Kuusela, M. Pour-Ghaz, R. Pini, A. Voss, A. Seppänen "Imaging of reactive transport in fractured cement-based materials with X-ray CT", *Cement and Concrete Composites*, 124: 104211, 2021.
16. M. Ozon, D. Stolzenburg, L. Dada, A. Seppänen, and K.E.J. Lehtinen: "Aerosol formation and growth rates from chamber experiments using Kalman smoothing", *Atmospheric Chemistry and Physics*, 21:12595-12611, 2021.
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18. J. Jauhiainen, M. Pour-Ghaz, T. Valkonen, A. Seppänen: "Non-planar electrical resistance tomography -based sensing skins for structural health monitoring", *Computer-Aided Civil and Infrastructure Engineering*, 36: 1488-1507, 2021.
19. J. Jauhiainen, P. Kuusela, A. Seppänen, T. Valkonen: Relaxed Gauss-Newton Methods with Applications to Electrical Impedance Tomography. *SIAM Journal on Imaging Sciences*, 13(3), 1415-1445, 2020.
20. A. Voss, M. Pour-Ghaz, M. Vauhkonen, A. Seppänen, "Retrieval of the saturated hydraulic conductivity of cement-based material using electrical capacitance tomography", *Cement and Concrete Composites*, 112: 103639, 2020.
21. R. Gopalakrishnan, M. Kukkonen, A. Seppänen, P. Packalen: "Utility of Image Point Cloud Data towards Generating Enhanced Multitemporal Multisensor Land Cover Maps", *International Journal of Applied Earth Observations and Geoinformation*, 86: 102012, 2020.
22. A. Voss, P. Hosseini, M. Vauhkonen, M. Pour-Ghaz, A. Seppänen: "Three-dimensional electrical capacitance tomography - a tool for characterizing moisture transport properties of cement-based materials", *Materials & Design*, 181: 107967, 2019.

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25. D. Liu, Y. Zhao, A. K. Khambampati, A. Seppänen, J. Du: "A parametric level set method for imaging multi-phase conductivity using electrical impedance tomography", *IEEE Transactions on Computational Imaging*, 4: 552 - 561, 2018.
26. R. Rashednia, O. Khalaf Alla, G. Gonzalez-Berrios, A. Seppänen, M. Pour-Ghaz: "Electrical Resistance Tomography Based Sensing Skin with Internal Electrodes for Crack Detection in Large Structures", *Materials Evaluation*, 76: 1405-1413, 2018.
27. C. Brandt, A. Seppänen: "Recovery from errors due to domain truncation in magnetic particle imaging - approximation error modeling approach", *Journal of Mathematical Imaging and Vision*, 60: 1196-1208, 2018.
28. D. Smyl, M. Pour-Ghaz, A. Seppänen: "Detection and reconstruction of complex structural cracking patterns with electrical imaging", *NDT & E International*, 99: 123-133, 2018.
29. T. Luostari, T. Lähivaara, P. Packalén, A. Seppänen: "Bayesian approach to single-tree detection in airborne laser scanning - use of training data for prior and likelihood modeling", *Journal of Physics: Conference Series*, 1047: 012008, 2018, doi :10.1088/1742-6596/1047/1/012008.
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35. G. González, V. Kolehmainen, A. Seppänen: "Isotropic and anisotropic total variation regularization in electrical impedance tomography", *Computers and Mathematics with Applications*, 74: 564-576, 2017.

36. P. Varvia, T. Lähivaara, M. Maltamo, P. Packalén, T. Tokola, A. Seppänen: "Uncertainty quantification in ALS-based species-specific growing stock volume estimation", *IEEE Transactions on Geoscience and Remote Sensing*, 55: 1671 – 1681, 2017.
37. A. Seppänen, M. Hallaji, M. Pour-Ghaz: "A functionally layered sensing skin for detection of corrosive elements and cracking", *Structural Health Monitoring*, 16: 215–224, 2017.
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44. G. González, J. Huttunen, V. Kolehmainen, A. Seppänen, M. Vauhkonen: "Experimental evaluation of 3D electrical impedance tomography with total variation prior", *Inverse Problems in Science & Engineering*, 24(8): 1411-1431, DOI: 10.1080/17415977.2015.1113961, 2016.
45. J.M. Bardsley, A. Seppänen, A. Solonen, H. Haario, J.P. Kaipio: "Randomize-then-optimize for sampling and uncertainty quantification in electrical impedance tomography", *SIAM Journal on Uncertainty Quantification*, 3: 1136–1158, 2015.
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A2. Chapters in research books (other than conference proceedings)

74. J.P. Kaipio, A. Seppänen, M. Vauhkonen, A. Lipponen, A. Voutilainen, A. Lehtikoinen, V. Rimpiläinen: "Process tomography and estimation of velocity fields", in *Industrial Tomography, Systems and Applications*, editor Mi Wang, Woodhead Publishing Series in Electronic and Optical Materials: Number 71, ISBN 978-1-78242-118-4, 2015.
75. J.P. Kaipio, S. Duncan, A. Seppänen, E. Somersalo, A. Voutilainen: "State estimation", a chapter in *Handbook of Process Imaging for Automatic Control*, editors: David Scott and Hugh McCann, CRC Press, ISBN 0-8247-5920-6, 2005.
76. S. Duncan, J.P. Kaipio, A.R. Ruuskanen, M. Malinen, A. Seppänen: "Control systems", a chapter in *Handbook of Process Imaging for Automatic Control*, editors: David Scott and Hugh

McCann, CRC Press, ISBN 0-8247-5920-6, 2005.

A3. Peer-reviewed articles in conference proceedings

77. M. Ziaul Arif, A. Seppänen, M. Vauhkonen: "State Estimation Approach for Spatio-Temporal Two-Phase Flow Imaging using Dual-Modal Electrical Tomography", Proceedings of the 11th World Congress on Industrial Process Tomography, Mexico City, Mexico, September 6-8, 2023.
78. A. Voss, M. Pour-Ghaz, M. Vauhkonen, A. Seppänen: "Three-dimensional Electrical Capacitance Tomography Imaging of Cement-based Materials - Application to Characterization of Moisture Transport Properties" in *Smart Monitoring, Assessment and Rehabilitation of Civil Structures (SMAR 2019)*, Potsdam, Germany, August 27-29, 2019.
79. O. Koskela, M. Lehti-Polojärvi, A. Seppänen, E. Figueiras, J. Hyttinen: "Finite element mapping for efficient image reconstruction in rotational electrical impedance tomography", *World Congress on Medical Physics and Biomedical Engineering*, Prague, Czech Republic, June 3-8, 2018.
80. R. Rashetnia, D. Smyl, M. Hallaji, A. Seppänen, M. Pour-Ghaz: "A Novel Two-Dimensional Distributed Temperature Sensor Based On Electrical Resistance Tomography", *11th International Workshop on Structural Health Monitoring*, Stanford, California, USA, September 12-14, 2017.
81. R. Rashetnia, A. Seppänen, M. Pour-Ghaz: "Preliminary Findings on The Size Dependence of Sensing Skin Damage Detection Resolution", *11th International Workshop on Structural Health Monitoring*, Stanford, California, USA, September 12-14, 2017.
82. A. Voss, M. Pour-Ghaz, M. Vauhkonen, A. Seppänen: "Difference Reconstruction Methods for Electrical Capacitance Tomography imaging of Two-dimensional Moisture Flow in Concrete", *9th International Conference on Inverse Problems in Engineering (ICIPE)*, Waterloo, Canada, May 23-26 2017.
83. T. Luostari, T. Lähivaara, P. Packalen, A. Seppänen: "Bayesian approach to single-tree detection in airborne laser scanning - use of training data for prior and likelihood modeling", *9th International Conference on Inverse Problems in Engineering (ICIPE)*, Waterloo, Canada, May 23-26 2017.
84. R. Rashetnia, D. Smyl, M. Hallaji, A. Seppänen, M. Pour-Ghaz: "Structural Health Monitoring using Electrical Resistance Tomography Based Sensing Skin: Detecting damage, corrosive elements, and temperature change", *9th International Conference on Inverse Problems in Engineering (ICIPE)*, Waterloo, Canada, May 23-26 2017.
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87. A. Seppänen, M. Hallaji, D. Smyl, M. Pour-Ghaz: "Electrical impedance tomography to monitor unsaturated moisture flows, and to detect corrosive elements and cracking in cementitious materials", *8th European Workshop On Structural Health Monitoring*, Bilbao, Spain, July 5-8, 2016.

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89. P. Varvia, T. Lähivaara, M. Maltamo, P. Packalén, T. Tokola, A. Seppänen "Uncertainty quantification in ALS-based species-specific growing stock volume estimation", *SilviLaser 2015 - ISPRS Geospatial Week*, La Grande Motte, France, September 28-30, 2015.
90. M. Hallaji, A. Seppänen, M. Pour-Ghaz: "Electrical Impedance Tomography-based Sensing Skin for Structural Health Monitoring", *International Workshop on Structural Health Monitoring*, Stanford, CA, USA, September 1-3, 2015.
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99. A. Lipponen, A. Seppänen and J. P. Kaipio: "Estimation of non-stationary velocity fields using Electrical Impedance Tomography", In *What Where When, Multi-dimensional Advances for Industrial Process Monitoring*, Leeds, UK, June 23 – 24, 2009.
100. A. Lipponen, A. Seppänen and J. P. Kaipio: "Non-stationary inversion with convection-diffusion models – approximation errors induced by non-steady-state flow fields", *3rd International Workshop on Process Tomography (IWPT-3)*, Tokyo, Japan, April 17 – 19, 2009.
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102. A. Seppänen, K. Karhunen, A. Lehtikoinen, J.P. Kaipio and P.J.M. Monteiro: “Electrical resistance tomography imaging of concrete”, In *proceedings of 2nd international Conference on Concrete Repair, Rehabilitation and Retrofitting*, Taylor & Francis Group, London, ISBN 978-0-415-46850-3, pp. 571-577, Cape Town, South Africa, November 24 – 26, 2008.
103. K. Karhunen, A. Seppänen, A. Lehtikoinen, P.J.M. Monteiro and J.P. Kaipio: “Crack identification in concrete with Electrical Resistance Tomography”, In *proceedings of 5th. European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2008)*, Venice, Italy, June 30 – July 5, 2008.
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105. A. Seppänen, A. Peltola, L.M. Heikkinen, J. Kourunen and J.P. Kaipio: "State estimation in process tomography – experimental study in 3D multi-phase flow case" (**Keynote Lecture**), In *Proceedings of 5th World Congress on Industrial Process Tomography*, Bergen, Norway, 2007.
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