

# Erkki J Somersalo

## List of Publications by Year in descending order

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154  
papers

5,943  
citations

117625

34  
h-index

76900

74  
g-index

157  
all docs

157  
docs citations

157  
times ranked

3339  
citing authors

#	ARTICLE	IF	CITATIONS
1	Overcomplete representation in a hierarchical Bayesian framework. <i>Inverse Problems and Imaging</i> , 2022, 16, 19.	1.1	3
2	Brain Energy Metabolism. , 2022, , 540-558.		0
3	Modeling Epidemic Spread among a Commuting Population Using Transport Schemes. <i>Mathematics</i> , 2021, 9, 1861.	2.2	2
4	Mining the Mind: Linear Discriminant Analysis of MEG Source Reconstruction Time Series Supports Dynamic Changes in Deep Brain Regions During Meditation Sessions. <i>Brain Topography</i> , 2021, 34, 840-862.	1.8	4
5	Bayesian particle filter algorithm for learning epidemic dynamics. <i>Inverse Problems</i> , 2021, 37, 115008.	2.0	9
6	Sparse reconstructions from few noisy data: analysis of hierarchical Bayesian models with generalized gamma hyperpriors. <i>Inverse Problems</i> , 2020, 36, 025010.	2.0	24
7	Metabolism plays a central role in the cortical spreading depression: Evidence from a mathematical model. <i>Journal of Theoretical Biology</i> , 2020, 486, 110093.	1.7	0
8	Metapopulation Network Models for Understanding, Predicting, and Managing the Coronavirus Disease COVID-19. <i>Frontiers in Physics</i> , 2020, 8, .	2.1	62
9	Computational Model of Electrode-Induced Microenvironmental Effects on pH Measurements Near a Cell Membrane. <i>Multiscale Modeling and Simulation</i> , 2020, 18, 1053-1075.	1.6	4
10	A Bayesian filtering approach to layer stripping for electrical impedance tomography. <i>Inverse Problems</i> , 2020, 36, 055014.	2.0	5
11	Sparsity Promoting Hybrid Solvers for Hierarchical Bayesian Inverse Problems. <i>SIAM Journal of Scientific Computing</i> , 2020, 42, A3761-A3784.	2.8	14
12	Bayesian Mesh Adaptation for Estimating Distributed Parameters. <i>SIAM Journal of Scientific Computing</i> , 2020, 42, A3878-A3906.	2.8	1
13	Brain Activity Mapping from MEG Data via a Hierarchical Bayesian Algorithm with Automatic Depth Weighting. <i>Brain Topography</i> , 2019, 32, 363-393.	1.8	19
14	Brain energetics plays a key role in the coordination of electrophysiology, metabolism and hemodynamics: Evidence from an integrated computational model. <i>Journal of Theoretical Biology</i> , 2019, 478, 26-39.	1.7	5
15	Hierachical Bayesian models and sparsity: <i>“<math>l_2</math>-magic</i> . <i>Inverse Problems</i> , 2019, 35, 035003.	2.0	27
16	Approximation of continuous EIT data from electrode measurements with Bayesian methods. <i>Inverse Problems</i> , 2019, 35, 045012.	2.0	3
17	Estimating hemodynamic stimulus and blood vessel compliance from cerebral blood flow data. <i>Journal of Theoretical Biology</i> , 2019, 460, 243-261.	1.7	3
18	Brain Energy Metabolism. , 2019, , 1-19.		2

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19	A computational model integrating brain electrophysiology and metabolism highlights the key role of extracellular potassium and oxygen. <i>Journal of Theoretical Biology</i> , 2018, 446, 238-258.	1.7	16
20	Iterative updating of model error for Bayesian inversion. <i>Inverse Problems</i> , 2018, 34, 025008.	2.0	31
21	Inverse problems: From regularization to Bayesian inference. <i>Wiley Interdisciplinary Reviews: Computational Statistics</i> , 2018, 10, e1427.	3.9	68
22	Bayes Meets Krylov: Statistically Inspired Preconditioners for CGLS. <i>SIAM Review</i> , 2018, 60, 429-461.	9.5	21
23	Beyond the Model Limit: Parameter Inference Across Scales. <i>SIAM-ASA Journal on Uncertainty Quantification</i> , 2017, 5, 665-693.	2.0	0
24	Priorconditioned CGLS-Based Quasi-MAP Estimate, Statistical Stopping Rule, and Ranking of Priors. <i>SIAM Journal of Scientific Computing</i> , 2017, 39, S477-S500.	2.8	5
25	Uncertainty quantification in flux balance analysis of spatially lumped and distributed models of neuron-astrocyte metabolism. <i>Journal of Mathematical Biology</i> , 2016, 73, 1823-1849.	1.9	8
26	Computational issues in linear multistep method particle filtering. <i>AIP Conference Proceedings</i> , 2016, , .	0.4	2
27	A hierarchical Krylov-Bayes iterative inverse solver for MEG with physiological preconditioning. <i>Inverse Problems</i> , 2015, 31, 125005.	2.0	32
28	Life sciences through mathematical models. <i>Rendiconti Lincei</i> , 2015, 26, 193-201.	2.2	5
29	A spatially distributed computational model of brain cellular metabolism. <i>Journal of Theoretical Biology</i> , 2015, 376, 48-65.	1.7	22
30	Stochastic modelling of muscle recruitment during activity. <i>Interface Focus</i> , 2015, 5, 20140094.	3.0	47
31	Artificial boundary conditions and domain truncation in electrical impedance tomography. Part I: Theory and preliminary results. <i>Inverse Problems and Imaging</i> , 2015, 9, 749-766.	1.1	13
32	Artificial boundary conditions and domain truncation in electrical impedance tomography. Part II: Stochastic extension of the boundary map. <i>Inverse Problems and Imaging</i> , 2015, 9, 767-789.	1.1	13
33	Statistical Methods in Imaging. , 2015, , 1343-1392.		1
34	Vectorized and parallel particle filter SMC parameter estimation for stiff ODEs. , 2015, , .		1
35	Parameter estimation for stiff deterministic dynamical systems via ensemble Kalman filter. <i>Inverse Problems</i> , 2014, 30, 105008.	2.0	28
36	Astrocytic tracer dynamics estimated from [1-11C]-acetate PET measurements. <i>Mathematical Medicine and Biology</i> , 2014, 32, dqu021.	1.2	4

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37	Inverse problems in the Bayesian framework. <i>Inverse Problems</i> , 2014, 30, 110301.	2.0	16
38	Dynamic updating of numerical model discrepancy using sequential sampling. <i>Inverse Problems</i> , 2014, 30, 114019.	2.0	16
39	Variable order smoothness priors for ill-posed inverse problems. <i>Mathematics of Computation</i> , 2014, 84, 1753-1773.	2.1	3
40	Modeling HIV-1 Dynamics and Fitness in Cell Culture Across Scales. <i>Bulletin of Mathematical Biology</i> , 2014, 76, 486-514.	1.9	4
41	Computational tools for calculating alternative muscle force patterns during motion: A comparison of possible solutions. <i>Journal of Biomechanics</i> , 2013, 46, 2097-2100.	2.1	20
42	Quantitative in silico Analysis of Neurotransmitter Pathways Under Steady State Conditions. <i>Frontiers in Endocrinology</i> , 2013, 4, 137.	3.5	22
43	Bayesian Preconditioned CGLS for Source Separation in MEG Time Series. <i>SIAM Journal of Scientific Computing</i> , 2013, 35, B778-B798.	2.8	5
44	Linear multistep methods, particle filtering and sequential Monte Carlo. <i>Inverse Problems</i> , 2013, 29, 085007.	2.0	22
45	Left and right preconditioning for electrical impedance tomography with structural information. <i>Inverse Problems</i> , 2012, 28, 055015.	2.0	18
46	MÃ©nage Ã  Trois: The Role of Neurotransmitters in the Energy Metabolism of Astrocytes, Glutamatergic, and GABAergic Neurons. <i>Journal of Cerebral Blood Flow and Metabolism</i> , 2012, 32, 1472-1483.	4.3	20
47	The Metabolism of Neurons and Astrocytes Through Mathematical Models. <i>Annals of Biomedical Engineering</i> , 2012, 40, 2328-2344.	2.5	16
48	Quantitative imaging with electrical impedance spectroscopy. <i>Physics in Medicine and Biology</i> , 2012, 57, 7289-7302.	3.0	8
49	A reaction-diffusion model of CO <sub>2</sub> influx into an oocyte. <i>Journal of Theoretical Biology</i> , 2012, 309, 185-203.	1.7	33
50	A hybrid stochastic-deterministic computational model accurately describes spatial dynamics and virus diffusion in HIV-1 growth competition assay. <i>Journal of Theoretical Biology</i> , 2012, 312, 120-132.	1.7	10
51	Bayesian mixture models for source separation in MEG. <i>Inverse Problems</i> , 2011, 27, 115001.	2.0	4
52	Dynamic activation model for a glutamatergic neurovascular unit. <i>Journal of Theoretical Biology</i> , 2011, 274, 12-29.	1.7	22
53	Hierarchical beamformer and cross-talk reduction in electroneurography. <i>Journal of Neural Engineering</i> , 2011, 8, 056002.	3.5	14
54	Statistical Methods in Imaging. , 2011, , 913-957.		1

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55	Interpretation of NMR Spectroscopy Human Brain Data with a Multi-Compartment Computational Model of Cerebral Metabolism. <i>Advances in Experimental Medicine and Biology</i> , 2011, 701, 249-254.	1.6	4
56	Metabolica: A statistical research tool for analyzing metabolic networks. <i>Computer Methods and Programs in Biomedicine</i> , 2010, 97, 151-167.	4.7	24
57	Energetics of Inhibition: Insights with a Computational Model of the Human GABAergic Neuron–Astrocyte Cellular Complex. <i>Journal of Cerebral Blood Flow and Metabolism</i> , 2010, 30, 1834-1846.	4.3	24
58	Hierarchical regularization for edge-preserving reconstruction of PET images. <i>Inverse Problems</i> , 2010, 26, 035010.	2.0	24
59	Astrocytes as the Glucose Shunt for Glutamatergic Neurons at High Activity: An In Silico Study. <i>Journal of Neurophysiology</i> , 2009, 101, 2528-2538.	1.8	44
60	Conditionally Gaussian Hypermodels for Cerebral Source Localization. <i>SIAM Journal on Imaging Sciences</i> , 2009, 2, 879-909.	2.2	75
61	In silico study of lactate metabolism in brain during visual stimulation. <i>FASEB Journal</i> , 2009, 23, LB113.	0.5	0
62	Perspectives in Numerical Analysis 2008. <i>BIT Numerical Mathematics</i> , 2008, 48, 163-165.	2.0	0
63	Dynamic Bayesian sensitivity analysis of a myocardial metabolic model. <i>Mathematical Biosciences</i> , 2008, 212, 1-21.	1.9	6
64	An adaptive smoothness regularization algorithm for optical tomography. <i>Optics Express</i> , 2008, 16, 19957.	3.4	11
65	Sampling-Based Analysis of a Spatially Distributed Model for Liver Metabolism at Steady State. <i>Multiscale Modeling and Simulation</i> , 2008, 7, 407-431.	1.6	12
66	Hypermodels in the Bayesian imaging framework. <i>Inverse Problems</i> , 2008, 24, 034013.	2.0	78
67	Inverse problems and computational cell metabolic models: a statistical approach. <i>Journal of Physics: Conference Series</i> , 2008, 124, 012003.	0.4	1
68	Computational modelling of cellular level metabolism. <i>Journal of Physics: Conference Series</i> , 2008, 124, 012011.	0.4	0
69	The inverse problem of brain energetics: ketone bodies as alternative substrates. <i>Journal of Physics: Conference Series</i> , 2008, 124, 012013.	0.4	1
70	A mathematical model of liver metabolism: from steady state to dynamic. <i>Journal of Physics: Conference Series</i> , 2008, 124, 012012.	0.4	7
71	Recovery of shapes: hypermodels and Bayesian learning. <i>Journal of Physics: Conference Series</i> , 2008, 124, 012014.	0.4	0
72	First Calderón Prize. <i>Journal of Physics: Conference Series</i> , 2008, 124, 011002.	0.4	0

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73	A unified Bayesian framework for algorithms to recover blocky signals. Proceedings of SPIE, 2007, , .	0.8	0
74	A Gaussian hypermodel to recover blocky objects. Inverse Problems, 2007, 23, 733-754.	2.0	51
75	Statistical inverse problems: Discretization, model reduction and inverse crimes. Journal of Computational and Applied Mathematics, 2007, 198, 493-504.	2.0	412
76	An experimental evaluation of state estimation with fluid dynamical models in process tomography. Chemical Engineering Journal, 2007, 127, 23-30.	12.7	25
77	Bayesian flux balance analysis applied to a skeletal muscle metabolic model. Journal of Theoretical Biology, 2007, 248, 91-110.	1.7	25
78	Bayesian flux balance analysis applied to a skeletal muscle metabolic model. Proceedings in Applied Mathematics and Mechanics, 2007, 7, 1120401-1120402.	0.2	0
79	An efficient deconvolution algorithm for estimating oxygen consumption during muscle activities. Computer Methods and Programs in Biomedicine, 2007, 85, 247-256.	4.7	3
80	Statistical Analysis of Metabolic Pathways of Brain Metabolism at Steady State. Annals of Biomedical Engineering, 2007, 35, 886-902.	2.5	27
81	Microlocal sequential regularization in imaging. Inverse Problems and Imaging, 2007, 1, 1-11.	1.1	10
82	Bayesian stationary state flux balance analysis for a skeletal muscle metabolic model. Inverse Problems and Imaging, 2007, 1, 247-263.	1.1	11
83	Large-scale Statistical Parameter Estimation in Complex Systems with an Application to Metabolic Models. Multiscale Modeling and Simulation, 2006, 5, 1333-1366.	1.6	25
84	Approximation errors and model reduction with an application in optical diffusion tomography. Inverse Problems, 2006, 22, 175-195.	2.0	187
85	Large-scale Bayesian parameter estimation for a three-compartment cardiac metabolism model during ischemia. Inverse Problems, 2006, 22, 1797-1816.	2.0	10
86	Image inpainting with structural bootstrap priors. Image and Vision Computing, 2006, 24, 782-793.	4.5	21
87	Using process tomography as a sensor for optimal control. Applied Numerical Mathematics, 2006, 56, 37-54.	2.1	26
88	Maxwell's equations with a polarization independent wave velocity: Direct and inverse problems. Journal Des Mathematiques Pures Et Appliquees, 2006, 86, 237-270.	1.6	24
89	Approximation Errors and Model Reduction in Optical Tomography. , 2006, 2006, 2659-62.		1
90	Local regularization method applied to estimating oxygen consumption during muscle activities. Inverse Problems, 2006, 22, 229-243.	2.0	7

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91	Approximation Errors and Model Reduction in Optical Tomography. Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 2006, , .	0.5	0
92	Bayesian image deblurring and boundary effects. , 2005, , .		3
93	Local regularization and Bayesian hypermodels. , 2005, , .		1
94	Representation of bioelectric current sources using Whitney elements in the finite element method. Physics in Medicine and Biology, 2005, 50, 3023-3039.	3.0	23
95	Statistical elimination of boundary artefacts in image deblurring. Inverse Problems, 2005, 21, 1697-1714.	2.0	19
96	Modeling anisotropic light propagation in a realistic model of the human head. Applied Optics, 2005, 44, 2049.	2.1	26
97	Compensation for geometric mismodelling by anisotropies in optical tomography. Optics Express, 2005, 13, 296.	3.4	60
98	Priorconditioners for linear systems. Inverse Problems, 2005, 21, 1397-1418.	2.0	41
99	Posterior covariance related optimal current patterns in electrical impedance tomography. Inverse Problems, 2004, 20, 919-936.	2.0	42
100	A modelling error approach for the estimation of optical absorption in the presence of anisotropies. Physics in Medicine and Biology, 2004, 49, 4785-4798.	3.0	23
101	Using tomographic measurements in process control. , 2004, , .		2
102	Anisotropic effects in highly scattering media. Physical Review E, 2003, 68, 031908.	2.1	105
103	Statistical inversion for medical x-ray tomography with few radiographs: I. General theory. Physics in Medicine and Biology, 2003, 48, 1437-1463.	3.0	123
104	Statistical inversion for medical x-ray tomography with few radiographs: II. Application to dental radiology. Physics in Medicine and Biology, 2003, 48, 1465-1490.	3.0	82
105	Non-stationary magnetoencephalography by Bayesian filtering of dipole models. Inverse Problems, 2003, 19, 1047-1063.	2.0	47
106	Regularization in Cardiac Source Imaging. Lecture Notes in Computer Science, 2003, , 101-110.	1.3	4
107	Estimation of optical absorption in anisotropic background. Inverse Problems, 2002, 18, 559-573.	2.0	44
108	Wind velocity observation with a CW Doppler radar. IEEE Transactions on Geoscience and Remote Sensing, 2002, 40, 2427-2437.	6.3	3

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109	Estimating Anomalies from Indirect Observations. Journal of Computational Physics, 2002, 181, 398-406.	3.8	11
110	Effects of inaccuracies in fluid dynamical models in state estimation of process tomography. , 2001, 4188, 69.		1
111	Complex Riemannian metric and absorbing boundary conditions. Journal Des Mathematiques Pures Et Appliquees, 2001, 80, 739-768.	1.6	30
112	Analysis of the PML equations in general convex geometry. Proceedings of the Royal Society of Edinburgh Section A: Mathematics, 2001, 131, 1183-1207.	1.2	62
113	Fluid dynamical models and state estimation in process tomography: Effect due to inaccuracies in flow fields. Journal of Electronic Imaging, 2001, 10, 630.	0.9	22
114	State estimation with fluid dynamical evolution models in process tomography - an application to impedance tomography. Inverse Problems, 2001, 17, 467-483.	2.0	94
115	State space models in process tomography " approximation of state noise covariance. Inverse Problems in Science and Engineering, 2001, 9, 561-585.	0.5	28
116	Statistical inversion and Monte Carlo sampling methods in electrical impedance tomography. Inverse Problems, 2000, 16, 1487-1522.	2.0	282
117	Nonstationary inverse problems and state estimation. Journal of Inverse and Ill-Posed Problems, 1999, 7, .	1.0	41
118	State Estimation in Time-Varying Electrical Impedance Tomography. Annals of the New York Academy of Sciences, 1999, 873, 430-439.	3.8	40
119	Visualization of Magnetoencephalographic Data Using Minimum Current Estimates. NeuroImage, 1999, 10, 173-180.	4.2	448
120	Inverse problems with structural prior information. Inverse Problems, 1999, 15, 713-729.	2.0	210
121	Computation of Electromagnetic Fields in Axisymmetric Rf Structures With Boundary Integral Equations. Journal of Electromagnetic Waves and Applications, 1999, 13, 445-491.	1.6	4
122	On the existence and convergence of the solution of PML equations. Computing (Vienna/New York), 1998, 60, 229-241.	4.8	116
123	Tikhonov regularization and prior information in electrical impedance tomography. IEEE Transactions on Medical Imaging, 1998, 17, 285-293.	8.9	476
124	Dynamical electric wire tomography: a time series approach. Inverse Problems, 1998, 14, 799-813.	2.0	21
125	Electrical impedance tomography with basis constraints. Inverse Problems, 1997, 13, 523-530.	2.0	92
126	Gas temperature mapping using impedance tomography. Inverse Problems, 1997, 13, 1177-1189.	2.0	3



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127	<title>Recursive estimation of fast-impedance changes in electrical impedance tomography and a related problem</title>. , 1997, 3171, 208.		3
128	<title>Impedance imaging and Markov chain Monte Carlo methods</title>. , 1997, 3171, 175.		11
129	Impedance Imaging and Electrode Models. , 1997, , 65-74.		3
130	Layer stripping for time-harmonic Maxwell's equations with high frequency. Inverse Problems, 1994, 10, 449-466.	2.0	14
131	Reconstruction of Singularities of a Scattering Potential in Two Dimensions. Advances in Applied Mathematics, 1994, 15, 97-113.	0.7	22
132	An inverse boundary value problem in electrodynamics. Duke Mathematical Journal, 1993, 70, 617.	1.5	140
133	Layer-stripping reconstruction algorithms in impedance imaging. , 1993, , 9-15.		1
134	Reconstruction of electromagnetic parameters from boundary measurements. , 1993, , 207-215.		0
135	Existence and Uniqueness for Electrode Models for Electric Current Computed Tomography. SIAM Journal on Applied Mathematics, 1992, 52, 1023-1040.	1.8	740
136	A linearized inverse boundary value problem for Maxwell's equations. Journal of Computational and Applied Mathematics, 1992, 42, 123-136.	2.0	69
137	Inversion of Discontinuities for the Schrödinger Equation in Three Dimensions. SIAM Journal on Mathematical Analysis, 1991, 22, 480-499.	1.9	34
138	Estimates for wave propagation in inhomogenous acoustic media. Journal of Mathematical Analysis and Applications, 1991, 162, 410-429.	1.0	4
139	Layer stripping: a direct numerical method for impedance imaging. Inverse Problems, 1991, 7, 899-926.	2.0	112
140	Helicopter-borne measurements of radar backscatter from forests. International Journal of Remote Sensing, 1990, 11, 1179-1191.	2.9	22
141	A Mathematical Model for Signal Analysis of FM Radar. Journal of Electromagnetic Waves and Applications, 1990, 4, 743-769.	1.6	1
142	Linear inverse problems for generalised random variables. Inverse Problems, 1989, 5, 599-612.	2.0	80
143	Determination of the Incident Field in EM Sounding by a Dispersion Relation. Journal of Electromagnetic Waves and Applications, 1989, 3, 199-208.	1.6	0
144	Electromagnetic inverse problems with surface measurements at low frequencies. Inverse Problems, 1989, 5, 1107-1116.	2.0	18

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145	Three-dimensional inverse scattering for the wave equation with variable speed: near-field formulae using point sources. <i>Inverse Problems</i> , 1989, 5, 1-6.	2.0	18
146	One-Dimensional Electromagnetic Inverse Reflection Problem: Formulation as a Riemann-Hilbert Problem and Imaging of Discontinuities. <i>SIAM Journal on Applied Mathematics</i> , 1989, 49, 944-951.	1.8	10
147	A Generalization of the Calderón-Vaillancourt Theorem to $L^p$ and $H^p$ . <i>Mathematische Nachrichten</i> , 1988, 138, 145-156.	0.8	40
148	The backus-gilbert method revisited: background, implementation and examples. <i>Numerical Functional Analysis and Optimization</i> , 1987, 9, 917-943.	1.4	10
149	Inverse scattering for standing wave solutions of the Schrödinger equation. <i>Journal of Mathematical Physics</i> , 1987, 28, 2416-2419.	1.1	0
150	The uniqueness of the one-dimensional electromagnetic inversion with bounded potentials. <i>Journal of Mathematical Analysis and Applications</i> , 1987, 127, 312-333.	1.0	5
151	Development Of Geophysical Algorithms For A Spaceborne Microwave Radiometer System. , 0, , .		1
152	A Bayesian approach and total variation priors in 3D electrical impedance tomography. , 0, , .		9
153	Construction of anatomy-based priors with anisotropic characteristics with application to electrical impedance tomography. , 0, , .		0
154	Modeling surface pH measurements of oocytes. <i>Biomedical Physics and Engineering Express</i> , 0, , .	1.2	1