

CURRICULUM VITAE

Marcus Kaiser, Ph.D. FRSB
Professor of Neuroinformatics

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Education/Qualifications

8/2005 Jacobs University Bremen, Germany
PhD in Neuroscience, special distinction
9/2002 Ruhr-University Bochum, Germany
“Diplom” (=BSc+MSc) Biology, first-class honours degree
Since 10/1998 Distance University Hagen, Germany
part time studies of Computer Science (Master’s level)

Professional History

2021 – Professor (Personal Chair) in Neuroinformatics,
University of Nottingham, UK
2019 – Guangci Visiting Professor, Dept of Functional Neurosurgery
Rui Jin Hospital, Shanghai Jiao Tong University, China
2015 – 2021 Professor (Personal Chair) in Neuroinformatics,
Newcastle University, UK
2010 – 2015 Associate Professor (Reader) in Neuroinformatics,
Newcastle University, UK
2009 – 2013 Visiting Associate Professor (part-time)
Seoul National University, South Korea
Department of Brain and Cognitive Sciences
2005 – 2010 Assistant Professor (RCUK Academic Fellow)
for Complex Neural Systems, Newcastle University, UK

Prizes, Awards and other Honours

2017 Elected member of the UK Computing Research Committee (UKCRC)
2016 Elected Fellow of the Royal Society of Biology (FRSB)
2003 – 2005 Fellow of the German National Merit Foundation (PhD scholarship)
2000 – 2002 Fritz-ter-Meer Foundation (Bayer PLC) (MSc studentship)

Professional Contributions

Memberships

UKCRC - UK Computing Research Committee (<http://www.ukcrc.org.uk/>) panel of leading
computing researchers from academia and industry (member since 2017)
RSB - Royal Society of Biology (Fellow since 2016)
IEEE - Institute of Electrical and Electronics Engineers
(Member since 2012; Senior Member since 2013)
BNA - British Neuroscience Association
ISMAR - International Society of Magnetic Resonance
ISMARM - International Society for Magnetic Resonance in Medicine (British Chapter)

UK Mathematical Neuroscience Network
UK INCF Special Interest Group in Image-based Neuroinformatics (Leader)
EPSRC Peer Review College
MRC 'Neurosciences and Mental Health Board' member for Computational Neuroscience
MRC Strategic Advisory Group 'Data Science'
IEEE Brain Neuroethics subcommittee Medical Applications
Braingrade GmbH – Scientific Advisory Board Member

Editorial board memberships

- *PLOS Computational Biology* (since 11/2019)
- *Royal Society Open Science* (since 12/2016)
- *Network Neuroscience*, MIT Press (since 4/2016)
- *Applied Network Science*, Springer (since 7/2015)
- *ACM Computing Reviews* (since 10/2012)
- *Frontiers in Neuroinformatics* (since 8/2007)
- *PLOS ONE* (since 9/2008)

Organizational management

- Chair of Neuroinformatics UK <http://www.neuroinformatics.org.uk/> (since 2017)
- Chair of the SIG in Neuroinformatics of the British Neuroscience Association (since 2018)
- Leader of the NHS CHAIN Technology Sub-group Computational Neurology (since 2016)
- Organization of the first UK INCF workshop on Image-based Neuroinformatics, Newcastle University, January 2012

University of Nottingham (2021 –)

- Director of the Research and Knowledge Exchange committee, Mental Health and Clinical Neuroscience unit, School of Medicine
- Co-Director of the Translational Neuroscience and Mental Health Centre of Excellence, Institute of Mental Health
- Lead of the NIHR Biomedical Research Centre research area 'Precision Neuromodulation'
- Lead for organising Nottingham Research Fellowship process, School of Medicine (2022/23)
- Member of the Research committee, School of Medicine

Newcastle University (2005 – 2021)

- Initiator/Co-Director of Wellcome Trust Systems Neuroscience PhD programme (since 2007)
- Leader of Neuroinformatics (<http://neuroinformatics.ncl.ac.uk/>)
- Leader of Neuroinformatics strand within our Bioinformatics master programme (since 2010)
- Chair of the IT Committee within the School of Computing (since 2015)

Reviewer for funding bodies

UK

Academy of Medical Sciences
Alzheimer Research UK
Biol. & Biotech. Res. Council (BBSRC)
Eng. & Phys. Sci. Res. Council (EPSRC)
Medical Research Council (MRC)
National Institute for Health Research (NIHR)
Wellcome Trust

Leverhulme Trust
Hadwen Trust
Lister Institute
Royal Society of Edinburgh

International

US National Science Foundation (NSF)
European Research Council (ERC)

French Research Foundation (ANR)
German Ministry for Research (BMBF)
Austrian Science Fund (FWF)
Swiss National Science Foundation (SNF)
Israel Science Foundation (ISF)
Canada Foundation for Innovation (CFI)

Banff International Research Station (BIRS)
Dutch Science Foundation (NWO)
US-Israel Binational Science Foundation
Hong-Kong Baptist University

Reviewer for journals

ACM Computing Reviews
American Journal of Psychiatry
Biological Psychiatry
BMC Neuroscience
Brain
Brain Connectivity
Brain Research Bulletin
Brain Structure and Function
British Journal of Neurosurgery
Cerebral Cortex
Chaos
Chinese Physics Letters
Clinical Neurophysiology
Current Biology
e-Life
European Journal of Neuroscience
European Physical Journal B
Epilepsia
F1000
Frontiers in Neuroinformatics
Human Brain Mapping
IEEE TUFFC
Journal of Alzheimer's Disease
Journal of Complex Networks
Journal of Neuroscience
Journal of the Royal Society Interface
Journal of Comparative Physiology A
National Science Review

Nature Communications
Nature Physics
Nature Reviews Neuroscience
Neural Networks
NeuroComputing
Neuroimage
Neuroimage Clinical
Neuroinformatics
Neurology
Neuron
New Journal of Physics
PeerJ
Phil. Trans. Roy. Soc. B
Physica A
Physical Review E
Physical Review Letters
PLOS Computational Biology
PLOS ONE*
PNAS
Proc. Roy. Soc. Lond. Ser. B
Proc. Roy. Soc. Lond. Ser. A
Scholarpedia
Science Advances
Scientific Reports
The Anatomical Record
Translational Psychiatry
Trends in Cognitive Sciences

Reviewer for publishers (journal and book proposals)

Cambridge University Press
MIT Press
Oxford University Press

Elsevier
Wiley-VCH Press

External reviewer for faculty selection or faculty tenure/promotion

Universities in EU, USA, China and Africa

GRANTS AWARDED

Current Grants

2022	EPSRC New Horizon grant (PI)	£200,000
2022	EPSRC NeuroMod+: Next-generation neuromodulation (Co-PI)	£1,265,849

Previous Grants

2021	EPSRC Transformative Healthcare Grant (PI)	£317,000
2021	EPSRC Impact Accelerator Award (PI)	£31,000
2020	NIHR AI in medicine grant OCTAHEDRON (Co-I)	£150,000
2019	MRC-KHIDI UK-Korea Dementia Research project (PI)	£305,000
2016	EPSRC Synthetic Biology Programme Grant (Co-I)	£4,350,000
2014	EPSRC/Wellcome Trust: Innovative Engineering for Health (Co-I)	£10,000,000
2017	NIHR - NUTH/NU platform for health data informatics (Co-I)	£108,000
2016	Alzheimer's Research UK Pilot Grant (Co-I)	£45,000
2015	Newcastle Healthcare Charity (Co-I)	£35,000
2014	School of Computing Science – Research Innovation Fund (PI)	£9,500
2013	EPSRC Standard Grant (PI)	£465,000
2013	NIHR: Disruption of brain connectivity in Lewy body dementias (Co-I)	£80,000
2012	BBSRC PhD studentship (PI)	£90,000
2011	EPSRC Impact Award (PI)	£26,495
2011	Amazon Cloud Computing Research Grant (PI)	\$7,500
2010	Santander Visiting Fellowship (PI)	£3,000
2009	EPSRC First Grant (PI)	£380,000
2009	Newcastle University, Computing Science Strategic Grant (PI)	£10,000
2009	KRF WCU-Visiting Professorship Seoul National University	£235,000
2009	BBSRC PhD studentship (PI)	£80,000
2007	Wellcome Trust - Four-year PhD programme (Co-PI)	£4,000,000
2007	Royal Society - Conference Travel Grant	£1,000
2007	International Center of Transdisciplinary Studies (ICTS), Jacobs University Bremen - Visiting Fellowship	£750
2007	Royal Society - Research Grant (PI)	£15,000
2006	EPSRC - CARMEN e-science (Co-I, total sum of grant)	£4,500,000
2006	EPSRC - CASE PhD studentship (PI)	£80,000
2005	DFG (German Research Council) - Conference Travel Grant	£750
2004	DAAD - academic exchange - Germany-USA (co-applicant)	£5,000

ACADEMIC SUPERVISION

Research fellows supervised

2008 – 2012	Jennifer Simonotto	2012 – 2019	Luis Peraza Rodriguez
2009	Christoph Feenders	2015 – 2016	Sol Lim
2010	Jinseop Kim*	2017 – 2019	Shouyong Jiang*
2010 – 2013	Cheol E. Han*	2021 – 2022	James Ross
2013 – 2016	Roman Bauer*	2023 –	Marilyn Gatica
2013 – 2015	Peter Taylor*	2022 –	Cyril Atkinson-Clement
2013 – 2016	Yujiang Wang*		

PhD students supervised

2009 – 2013	Henrik Kjeldsen*	now professor at Aarhus University, Denmark
2009 – 2014	Richard Tomsett	BBSRC programme
2010 – 2015	Sol Lim	Korean Research Foundation
2013 – 2016	Chris Papasavvas	Wellcome Trust programme
2014 – 2019	Chris Thornton	BBSRC programme
2014 – 2019	Frances Hutchings	Computing Science Studentship
2016 – 2019	Julia Schumacher	
2018 – 2020	Xue Chen*	now professor at Qingdao University, China
2015 – 2020	Chris Hayward	SAGe Faculty DTA studentship
2017 – 2020	Ramtin Mehraram	
2017 – 2021	Nishant Sinha	Computing Science / IoN studentship
2014 – 2023	Michael Mackay	Staff PhD student (part-time)

*: now faculty members

PhDs examined (external)

2023	Arthur Spencer	Bristol University, United Kingdom
2022	Giorgia Giulia Evangelista	EPFL, Switzerland
2021	Zhuo Wan	Warwick University, United Kingdom
2021	Sarvani Das	Southampton University, United Kingdom
2020	Stephen Bonner	Durham University, United Kingdom
2018	Sebastian Rinke	Technical University Darmstadt, Germany
2018	Keith Smith	Edinburgh University, United Kingdom
2017	Siti Makhtar	York University, United Kingdom
2016	Ye Yao	Warwick University, United Kingdom
2015	Peter Eipert	Rostock University, Germany
2015	Sarvenaz Choobdar	University of Porto, Portugal
2012	David Samu	Sussex University, United Kingdom
2011	Pedro Ribeiro	University of Porto, Portugal
2007	Lucia Zemanova	Potsdam University, Germany

TEACHING ACTIVITY

Higher education teaching qualification

2009	Certificate in Advanced Studies in Academic Practice, Newcastle University recognized as Higher Education Academy (HEA) Associate Fellow
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Undergraduate and graduate teaching

2002 – 2005	Jacobs University Bremen, Germany
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- 2005 – Newcastle University
- Computing Environments for Bioinformatics module (Perl, SQL)
 - Neuroinformatics and Computational Neuroscience module
 - Complex Systems module (network analysis & dynamical systems)
 - Lecture on Connectomics, MSc Neuroscience
 - Lecture on Neuroinformatics, IoN Research Summer School
- 2010 – 2012 Seoul National University
- Neuroinformatics and Computational Neuroscience module
 - Lecture on Neuroinformatics and Connectomics, PhD programme
- 2011 Tutorial on Connectome Analysis at Computational Neuroscience Society Annual Meeting, Stockholm, Sweden

Public understanding of science

- 2022 Public Lecture Nottingham University, UK
- 2017 Public Lecture Computing at School North East Meeting, Newcastle, UK
- 2014 YouTube Channel: <https://www.youtube.com/c/DynamicConnectomeLab>
- 2013 Comic British Science Festival, Newcastle, UK
- 2006 Interview BBC Radio, UK
- 2005 Public lecture Benjamin der Wissenschaft, Bremen, Germany

PUBLICATIONS

Currently 5,300 citations in ISI (<https://www.webofscience.com/wos/author/rid/A-7166-2008>) and 9,800 in Google Scholar (h-index: 46; http://scholar.google.com/citations?user=Ha_ZNikAAAAJ)
 ORCID <https://orcid.org/0000-0002-4654-3110>

Books

Kaiser M. Changing Connectomes: Evolution, Development and Dynamics in Network Neuroscience. MIT Press, 2020.
<https://mitpress.mit.edu/books/changing-connectomes>

Bota M, Crook S, Kaiser M (eds.) Producing and Analyzing Macro-Connectomes: Current State and Challenges. Frontiers Research Topic, 2016.

Kaiser M, Hilgetag CC, Kötter R (eds.) Hierarchy and dynamics in neural networks. Frontiers Research Topic, 2012.

PhD thesis

2005 Neural and Biochemical Networks: Organization, Development, and Robustness

Preprints

1. Atkinson-Clement C, Junor A, Kaiser M. A large-scale online survey of patients and the general public: Preferring safe and noninvasive neuromodulation for mental health. *medRxiv* 2024-301043v3, 2024

- Gatica M, Atkinson-Clement C, Mediano PAM, Alkhawashki M, Ross J, Sallet J, Kaiser M. Transcranial ultrasound stimulation effect in the redundant and synergistic networks consistent across macaques. *bioRxiv* 2023.11. 02.564776, 2023.

Peer-reviewed Journal Publications

- Kaiser M. Ten simple rules for establishing an experimental lab. *PLOS Computational Biology* 20:e1011778, 2024.
- Kopetzky SJ, Li Y, Kaiser M, Butz-Ostendorf M. Predictability of intelligence and age from structural connectomes. *PLOS ONE*, in press.
- Mackay M, Huo S, Kaiser M. Spatial organisation of the mesoscale connectome: A feature influencing synchrony and metastability of network dynamics. *PLOS Computational Biology*, 19(8): e1011349, 2023.
- Kaiser M. Connectomes: From a sparsity of networks to large-scale databases. *Frontiers in Neuroinformatics* 17:1170337, 2023
- Hayward C, Huo S, Chen X, Kaiser M. Non-optimal component placement of the human connectome supports variable brain dynamics. *Network Neuroscience* 7(1), 254-268, 2023.
- Yu Q, Yin D, Kaiser M, Xu G, Guo M, Liu F, Li J, Fan M. Pathway-Specific Mediation Effect between Structure, Function, and Motor Impairment After Subcortical Stroke. *Neurology*, 100 (6), e616-e626, 2023.
- Zaaimi B, Turnbull M, Hazra A, Wang Y, de Souza CG, Escobedo-Cousin E, Idil AS, Bailey R, Tardio S, Patel A, Ponon N, Hutchings F, Kaiser M, Cunningham MO, Clowry GJ, LeBeau FE, Constandinou TG, Baker SN, Donaldson N, Degenaar P, O'Neill A, Trevelyan AJ, Jackson A. Closed-loop optogenetic control of normal and pathological network dynamics. *Nature Biomedical Engineering*, 7 (4), 559-575, 2023.
- Mehrram R., Peraza L.R., Murphy N.R.E., Cromarty R.A., Graziadio S., O'Brien J.T., Killen A., Colloby S.J., Firbank M., Su L., Collerton D., Taylor J.-P., Kaiser M. Functional and structural brain network correlates of visual hallucinations in Lewy body dementia. *Brain*, 145 (6), 2190-2205, 2022.
- Huo S, Yong Zou Y, Kaiser M, Liu Z. Time-limited self-sustaining rhythms and state transitions in brain networks. *Physical Review Research*, 4 (2), 023076, 2022.
- Lai Y, Naying He N, Wei H, Deng L, Zhou H, Li J, Kaiser M, Zhang C, Li D, Sun B. Value of functional connectivity in outcome prediction for pallidal stimulation in Parkinson's disease. *Journal of Neurosurgery*, 2022.
- Breitwieser L, Hesam A, de Montigny J, Vavourakis V, Iosif A, Jennings J, Kaiser M, Manca M, Di Meglio A, Al-Ars Z, Rademakers F, Mutlu O, Bauer R. BioDynaMo: a modular platform for high-performance agent-based simulation. *Bioinformatics*, 38 (2), 453-460, 2022.
- Jiang S, Otero-Muras I, Banga J, Wang Y, Kaiser M, Krasnogor N. OptDesign: Identifying Optimum Design Strategies in Strain Engineering for Biochemical Production. *ACS Synthetic Biology*, 2022.
- Ortiz-Rios M, Balezeau F, Haag M, Schmid MC, Kaiser M. Dynamic reconfiguration of macaque brain networks during natural vision. *Neuroimage*, 244, 118615, 2021.
- Firfilionis D, Hutchings F, Tamadoni R, Walsh D, Turnbull M, Escobedo-Cousin E, Bailey RG, Gausden J, Patel A, Haci D, Liu Y, LeBeau F, Trevelyan A, Constandinou TG, O'Neill A, Kaiser M, Degenaar P, Jackson A. A Closed-Loop Optogenetic Platform. *Frontiers in Neuroscience*, 15, 718311, 2021.
- Chen X, Necus J, Peraza Rodriguez L, Mehrram R, Wang Y, O'Brien J, Blamire A, Kaiser M, Taylor JP. The functional brain favours segregated modular connectivity at old age unless targeted by neurodegeneration. *Nature Communications Biology*, 4 (1), 1-16, 2021.
- Chen X, Wang Y, Kopetzky SJ, Butz-Ostendorf M, Kaiser M. Connectivity within regions characterizes epilepsy duration and treatment outcome. *Human Brain Mapping*, 42: 3777-

- 3791, 2021.
17. Hall GR, Kaiser M, Farr TD. Stroke induced functional connectivity change is comparable from mouse to man. *Stroke*, doi:10.1161/STROKEAHA.121.034097, 2021.
 18. Yin D, Kaiser M. Understanding Neural Flexibility from a Multifaceted Definition. *Neuroimage*, 235:118027, 2021.
 19. Bauer R, Clowry G, Kaiser M. Creative destruction: a basic computational model of cortical layer formation. *Cerebral Cortex*, 31:3237-3253, 2021.
 20. Lee S, Kim D, Youn HC, Hyung WSW, Suh S, Kaiser M, Han CE, Jeong HG. Brain network analysis reveals that amyloidopathy affects comorbid cognitive dysfunction in older adults with depression. *Scientific Reports*, 11:4299, 2021.
 21. Carmon J, Heege J, Necus JH, Owen TW, Pipa G, Kaiser M, Taylor PN, Wang Y. Reliability and comparability of human brain structural covariance networks. *Neuroimage* 117104, 2020.
 22. Hutchings F, Thornton C, Zhang C, Wang Y, Kaiser M. Predicting the Impact of Electric Field Stimulation in a Detailed Computational Model of Cortical Tissue. *Journal of Neural Engineering*, in press (arXiv preprint arXiv:2001.10414).
 23. Kaiser M. Functional compensation after lesions: Predicting site and extent of recovery. arXiv preprint arXiv:2005.03093, 2020.
 24. Jiang S, Li H, Guo J, Zhong M, Yang S, Kaiser M, Krasnogor N. NIHBA: A Network Interdiction Approach for Metabolic Engineering Design. *Bioinformatics*, 10.1093/bioinformatics/btaa163, 2020.
 25. Pappasavvas CA, Trevelyan AJ, Kaiser M, Wang Y. Divisive gain modulation enables flexible and rapid entrainment in a neocortical microcircuit model. *Journal of Neurophysiology*, 123:1133-1143, 2020.
 26. Giannakakis E, Hutchings F, Pappasavvas CA, Han CE, Weber B, Zhang C, Kaiser M. Computational modelling of the long-term effects of brain stimulation on the local and global structural connectivity of epileptic patients. *PLOS ONE* 15 (2), e0221380, 2020.
 27. Giannakakis E, Han CE, Weber B, Hutchings F, Kaiser M. Towards simulations of long-term behavior of neural networks: Modelling synaptic plasticity of connections within and between human brain regions. *Neurocomputing*, 416:38-44, 2020.
 28. Jiang S, Li H, Guo J, Zhong M, Yang S, Kaiser M, Krasnogor N. AREA: An adaptive reference-set based evolutionary algorithm for multiobjective optimisation. *Information Sciences* 515: 365-387, 2020.
 29. Mehraram R, Kaiser M, Cromarty R, Graziadio S, O'Brien JT, Killen A, Taylor JP, Peraza LR. Weighted network measures reveal differences between dementia types: An EEG study. *Human Brain Mapping* 41: 1573– 1590, 2020.
 30. Kaiser M. Computational models and fundamental constraints can inform the design of synthetic connectomes. *Physics of Life Reviews*, 2019.
 31. Schumacher J, Cromarty R, Gallagher P, Firbank MJ, Thomas AJ, Kaiser M, Blamire AM, O'Brien JT, Peraza LR, Taylor JP. Structural correlates of attention dysfunction in Lewy body dementia and Alzheimer's disease: An ex-Gaussian analysis. *Journal of Neurology*, 266(7): 1716–1726, 2019.
 32. Schumacher J, Peraza L, Firbank M, Thomas A, Kaiser M, Gallagher P, O'Brien J, Blamire A, Taylor JP. Dysfunctional brain dynamics and their origin in Lewy body dementia. *Brain*, 142(6): 1767–1782, 2019.
 33. Schumacher J, Peraza L, Firbank M, Thomas A, Kaiser M, Gallagher P, O'Brien J, Blamire A, Taylor JP. Dynamic functional connectivity changes in dementia with Lewy bodies and Alzheimer's disease. *Neuroimage: Clinical*, 22: 101812, 2019.
 34. Jiang S, Kaiser M, Yang S, Krasnogor N. A Scalable Test Suite for Continuous Dynamic Multiobjective Optimisation. *IEEE Transactions on Cybernetics*, 1-13, 10.1109/TCYB.2019.2896021, 2019.

35. Thornton C, Hutchings F, Kaiser M. The Virtual Electrode Recording Tool for EXtracellular Potentials (VERTEX) Version 2.0: Modelling *in vitro* electrical stimulation of brain tissue. *Wellcome Open Research*, 4:20, 2019.
36. Sinha N, Wang Y, Dauwels J, Kaiser M, Thesen T, Forsyth R, Taylor PN. Computer modelling of connectivity change suggests epileptogenesis mechanisms in idiopathic generalised epilepsy. *Neuroimage: Clinical*, 21:101655, 2019.
37. Peraza LR, Díaz A, Kennion O, Moratal B, Taylor JP, Kaiser M, Bauer R. Structural connectivity centrality changes mark the path towards Alzheimer's disease. *Alzheimer's & Dementia: Diagnosis, Assessment & Disease Monitoring*, 11:98-107, 2019.
38. Cromarty RA, Schumacher J, Graziadio S, Gallagher P, Killen A, Firbank MJ, Blamire AM, Kaiser M, Thomas AJ, O'Brien JT, Peraza LR, Taylor JP. Structural Brain Correlates of Attention Dysfunction in Lewy Body Dementias and Alzheimer's Disease. *Frontiers in Aging Neuroscience*, 10.3389/fnagi.2018.00347, 2018.
39. Schumacher J, Peraza L, Firbank M, Thomas A, Kaiser M, Gallagher P, O'Brien J, Blamire A, Taylor JP. Functional connectivity in dementia with Lewy bodies: A within- and between-network analysis. *Human Brain Mapping*, 10.1002/hbm.23901, 2018.
40. Gonzalez-de-Aledo P, Vladimirov A, Manca M, Baugh J, Asai R, Kaiser M, Bauer R. An optimization approach for agent-based computational models of biological development. *Advances in Engineering Software*, 121:262-275, 2018.
41. Kaiser M. Mechanisms of Connectome Development. *Trends in Cognitive Sciences*, 21:703-717, 2017.
42. Wang Y, Trevelyan AJ, Taylor PN, Valentin A, Alarcon G, Kaiser M. Mechanisms underlying different onset patterns of focal seizures. *PLOS Computational Biology*, 13(5): e1005475, 2017.
43. Sinha N, Dauwels J, Kaiser M, Cash SS, Brandon Westover M, Wang Y, Taylor PN. Reply: Computer models to inform epilepsy surgery strategies: prediction of postoperative outcome. *Brain* doi:10.1093/brain/awx068, 2017.
44. Bauer R, Kaiser M. Nonlinear growth: an origin of hub organization in complex networks. *Royal Society Open Science*, 4:160691, 2017.
45. Peraza L, Nesbitt D, Lawson R, Duncan G, Yarnall A, Khoo T, Kaiser M, Firbank M, O'Brien J, Barker R, Brooks D, Burn D, Taylor JP. Intra- and inter-network functional alterations in Parkinson's disease with mild cognitive impairment. *Human Brain Mapping*, 38(3):1702-1715, 2017.
46. Taylor PN, Wang Y, Kaiser M. Within brain area tractography suggests local modularity using high resolution connectomics. *Scientific Reports*, 7:39859, 2017.
47. Sinha N, Dauwels J, Wang Y, Kaiser M, Cash SS, Westover MB, Taylor PN. Predicting neurosurgical outcomes in focal epilepsy patients using computational modelling. *Brain*, 140(2):319-332, 2017.
48. Wang Y, Necus J, Kaiser M, Mota B. Universality in human cortical folding in health and disease. *Proc. Natl. Acad. Sci. USA*, 113(45):12820–12825, 2016.
49. Ainsworth M, Lee S, Kaiser M, Simonotto J, Cunningham MO, Kopell N, Whittington MA. GABA_B receptor-mediated, layer-specific synaptic plasticity reorganises gamma frequency neocortical response to stimulation. *Proc. Natl. Acad. Sci. USA* 113:E2721–E2729, 2016.
50. Thanarajah SE, Han CE, Rotarska-Jagiela A, Singer W, Deichmann R, Maurer K, Kaiser M, Uhlhaas P. Abnormal Connectional Fingerprints in Schizophrenia: A Novel Network Analysis of Diffusion Tensor Imaging Data. *Frontiers in Psychiatry* 7:114, 2016.
51. Luis R. Peraza LR, Colloby SJ, Deboys L, O'Brien JT, Kaiser M, Taylor JP. Regional functional synchronizations in dementia with Lewy bodies and Alzheimer's disease. *International Psychogeriatrics*, 28(7):1143-1151, 2016.
52. Hutchings F, Han CE, Keller S, Weber B, Taylor PN, Kaiser M. Predicting Surgery Targets in Temporal Lobe Epilepsy through Structural Connectome Based Simulations.

- PLOS Computational Biology* 11:e1004642, 2015.
53. Lo YP, O'Dea R, Crofts JJ, Han CE, Kaiser M. A geometric network model of intrinsic grey-matter connectivity of the human brain. *Scientific Reports* 5:15397, 2015.
 54. Papasavvas CA, Wang Y, Trevelyan AJ, Kaiser M. Gain control through divisive inhibition prevents abrupt transition to chaos in a neural mass model. *Physical Review E* 92:032723, 2015.
 55. Peraza LR, Colloby SJ, Firbank MJ, Greasy GS, McKeith IG, Kaiser M, O'Brien J, Taylor JP. Resting state in Parkinson's disease dementia and dementia with Lewy bodies: Commonalities and differences. *International Journal of Geriatric Psychiatry* 30: 1135–1146, 2015.
 56. Peraza LR, Taylor JP, Kaiser M. Divergent brain functional network alterations in dementia with Lewy bodies and Alzheimer's disease. *Neurobiology of Aging* 36: 2458–2467, 2015.
 57. Kjeldsen H, Kaiser M, Whittington MA. Near-Field Electromagnetic Holography for high-resolution analysis of network interactions in neuronal tissue. *Journal of Neuroscience Methods* 253:1-9, 2015.
 58. Taylor PN, Thomas J, Sinha N, Dauwels J, Kaiser M, Thesen T, Ruths J. Optimal control based seizure abatement using patient derived connectivity. *Frontiers in Neuroscience* 9:202, 2015.
 59. Kaiser M. Neuroanatomy: Connectome Connects Fly and Mammalian Brain Networks. *Current Biology* 25:R416–R418, 2015.
 60. Lim S, Han CE, Uhlhaas P, Kaiser M. Preferential Detachment During Human Brain Development: Age- and Sex- Specific Structural Connectivity in Diffusion Tensor Imaging (DTI) Data. *Cerebral Cortex*, 25(6):1477-1489, 2015.
 61. Tomsett RJ, Ainsworth M, Thiele A, Sanayei M, Chen X, Gieselmann A, Whittington MA, Cunningham MO, Kaiser M. Virtual Electrode Recording Tool for EXtracellular potentials (VERTEX): Comparing multi-electrode recordings from simulated and biological mammalian cortical tissue. *Brain Structure and Function*, 220: 2333-2353, 2015.
 62. Yoo SW, Han CE, Shin JS, Seo SW, Na DL, Kaiser M, Jeong Y, Seong JK. A Network Flow-based Analysis of Cognitive Reserve in Normal Ageing and Alzheimer's Disease. *Nature Scientific Reports* 5:10057, 2015.
 63. Taylor PN, Han CE, Schoene-Baked JC, Weber B, Kaiser M. Structural connectivity changes in temporal lobe epilepsy: Spatial features contribute more than topological measures. *Neuroimage: Clinical* 8:322-328, 2015.
 64. Lim S, Kaiser M. Overlapping time windows for axon growth lead to higher bidirectionality and non-overlapping time windows produce longer connections in a computer model of neuronal network development. *Biological Cybernetics* 109:275-286, 2015.
 65. Kim JS, Kaiser M. From *Caenorhabditis elegans* to the Human Connectome: Lower dispersion and fewer rules reduce evolutionary and developmental costs. *Phil Trans Roy Soc B* 369:20130529, 2014.
 66. Huett MT, Kaiser M, Hilgetag CC. Perspective: Network-guided pattern formation of neural dynamics. *Phil Trans Roy Soc B* 369:20130522, 2014.
 67. Bauer R, Kaiser M, Stoll E. A computational model for the origins of glioma. *PLOS ONE* 9: e111219, 2014.
 68. Taylor PN, Kaiser M, Dauwels J. Structural connectivity based whole brain modelling in epilepsy. *Journal of Neuroscience Methods* 236:51–57, 2014.
 69. Peraza L, Kaiser M, Firbank M, Graziadio S, Bonanni L, Onofrj M, Blamire A, O'Brien J, Taylor JP. fMRI resting state networks and their association with cognitive fluctuations in dementia with Lewy bodies. *NeuroImage: Clinical* 4:558–565, 2014.
 70. Klein D, Rotarska-Jagiela A, Genc E, Shritaran S, Mohr H, Roux F, Han CE, Kaiser M, Singer W, Uhlhaas PJ. Adolescent Brain Maturation and Cortical Folding: Evidence for Reductions in Gyrfication. *PLOS ONE*, 9:e84914, 2014.

71. Kaiser M. The potential of the human connectome as a biomarker of brain disease. *Frontiers in Human Neuroscience* 7:484, 2013.
72. O'Dea R, Crofts J, Kaiser M. Spreading Dynamics On Spatially Constrained Complex Brain Networks. *Journal of the Royal Society: Interface* 10: 20130016, 2013.
73. Bohr I, Kenny E, Blamire A, O'Brien J, Thomas A, Richardson R, Kaiser M. Resting-state functional connectivity in late-life depression: higher global connectivity and more long distance connections. *Frontiers in Neuropsychiatric Imaging and Stimulation* 3:116. doi: 10.3389/fpsy.2012.00116, 2013.
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 96. da Fontoura Costa L, Kaiser M, Hilgetag CC. Predicting the connectivity of primate cortical networks from topological and spatial node properties. *BMC Systems Biology*, 1:16, 2007.
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Peer-reviewed conference proceedings

1. Torres M, Jiang S, Pelta D, Kaiser M, Krasnogor N. Strain Design as Multiobjective Network Interdiction Problem: A Preliminary Approach. CAEPIA, Lecture Notes in Artificial Intelligence, 2018.
2. Jiang S, Krasnogor N, Kaiser M, Wan S, Guo J, Yang S. An empirical study of dynamic triobjective optimisation problems. IEEE Congress on Evolutionary Computation, 2018.
3. Jiang S, Kaiser M, Guo J, Yang S, Krasnogor N. Less detectable environmental changes in dynamic multiobjective optimisation. Proceedings of the Genetic and Evolutionary Computation Conference, 673-680, 2018.
4. Han CE, Peraza LR, Taylor JP, Kaiser M. Predicting Age across Human Lifespan Based on Structural Connectivity from Diffusion Tensor Imaging. IEEE Biomedical Circuits and Systems Conference, 2014.
5. Brust MR, Turgut D, Ribeiro CHC, Kaiser M. Is the Clustering Coefficient a Measure for Fault Tolerance in Wireless Sensor Networks? IEEE International Conference on Communication, 2012.
6. Ribeiro P, Silva F, Kaiser M. Strategies for Network Motifs Discovery. Fifth IEEE International Conference on e-Science, 2009.

7. Smith LS, Austin J, Baker S, Borisyuk R, Eglén S, Feng J, Gurney K, Jackson T, Kaiser M, Overton P, Panzeri S, Quián Quiroga R, Schultz SR, Sernagor E, Smith VA, Smulders TV, Stuart L, Whittington MA, Ingram CD. The CARMEN e-Science pilot project: Neuroinformatics work packages. Proceedings of the UK e-Science All Hands Meeting, 591-598, 2007.

Book chapters

1. Bauer R, Kaiser M, Cardarelli R, Aielli G. Considerations on Brain-Machine Interfaces from a Neuroscience and Physics Perspective. In: Handbook of Complexity in Medicine. Springer, 2025.
2. Jiang S, Torres M, Pelta D, Krabben P, Kaiser M, Krasnogor N. Improving microbial strain design via multiobjective optimisation and decision making. In: AI for Synthetic Biology 2, 2018.
3. Bauer R, Breitwieser L, Di Meglio A, Johard L, Kaiser M, Manca M, Rademakers F, Talanov M, Tchitchigin AD. The BioDynaMo Project: Experience Report. In: Vallverdu, Mazzara, Talanov, Distefano & Lowe: Advanced Research on Biologically Inspired Cognitive Architectures. IGI Global, 2017.
4. Lim S, Hutchings F, Kaiser M. Modeling the impact of lesions in the brain. In: van Ooyen & Butz-Ostendorf, Rewiring the Brain: A Computational Approach to Structural Plasticity in the Adult Brain. Academic Press, 2017.
5. Bauer R, Kaiser M. Organisational Principles of Connectomes: Changes during Evolution and Development. In: Shigeno, Murakami & Nomura, Brain Evolution by Design. Springer, 2017.
6. Wang Y, Hutchings F, Kaiser M. Computational Modelling of Neurostimulation in Brain Diseases. Progress in Brain Research, Vol. 222, Amsterdam: Elsevier, pp. 191-228, 2015.
7. Kaiser M. Neuropathologies and Networks. Encyclopedia of Computational Neuroscience. Springer, 2014.
8. Kaiser M, Hilgetag C. Wiring principles, Optimization. Encyclopedia of Computational Neuroscience. Springer, 2014.
9. Kaiser M, Simonotto J. Limited Spreading: How Hierarchical Networks prevent the Transition to the Epileptic State. In Steyn-Ross/Steyn-Ross: Modeling Phase Transitions in the Brain". Springer, 2010.
10. Kaiser M, Simonotto J. Structural and Functional Dynamics in Cortical and Neuronal Networks. In: Dehmer /Emmert-Streib, Analysis of Complex Networks: From Biology to Linguistics". Wiley-VCH, 2009.
11. Kaiser M. Multiple-scale hierarchical connectivity of cortical networks limits the spread of activity. In: Soltesz/Stanley: Computational Neuroscience in Epilepsy". Academic Press, New York, 2008.
12. Hilgetag CC, Kaiser M. Organization and Function of Complex Cortical Networks. In: beim Graben/Zhou/Thiel/Kurths: Lectures in supercomputational neuroscience: dynamics in complex brain networks". Springer, Heidelberg, 2008.

Book reviews

1. Kaiser M. Book review for 'Rao R: Brain-computer interfacing: an introduction. Cambridge University Press' in *ACM Computing Reviews*, 2014.
2. Kaiser M. Book review for 'Sporns O: Discovering the human connectome. MIT Press' in *ACM Computing Reviews*, 2012.
3. Kaiser M. Book review for 'Oliveira & Stewart: Writing Scientific Software: A Guide to Good Style. Cambridge University Press', *Higher Education Academy (HEA) Subject Centre for Information and Computer Sciences*, 2008.

Other publications

1. Gibson F, Overton P, Smulders T, Schultz S, Eglen SJ, Ingram CD, Panzeri S, Bream P, Sernagor E, Cunningham M, Adams C, Echtermeyer C, Simonotto J, Kaiser M, Swan D, Fletcher M, Lord P. Minimum Information about a Neuroscience Investigation (MINI) Electrophysiology. *Nature Precedings* 1720.1, 2008.
2. Hilgetag CC, Kaiser M. Die Netzwerk-Struktur biologischer Systeme. *BIOforum*, (4):32-33, 2005.
3. Kaiser M. Spatial network growth: Generating small-world, scale-free, and multi-cluster spatial networks. *Technical Report No. 1, IUB School of Engineering and Science*, 2005

Press coverage / Public engagement

1. Interview for psychreg.org, 2021
<https://www.youtube.com/watch?v=kQtSBYTJe9k>
2. 健康地老去 / Staying healthy as we age, Advance Medical, 2019
<https://mp.weixin.qq.com/s/mj7j-Fw6BvRCGjEaiCNV-Q>
3. Video interview for the Alzheimer Research UK (ARUK) conference, 2019
<https://vjdementia.com/speaker/marcus-kaiser/>
4. How even our brains get 'slacker' as we age (author: Dr Yujiang Wang): BBC Radio 4 Today programme, Daily Mail, Daily Mirror, Der Standard, El Mundo, Sun, October 2016
5. Virtual brain surgery could personalise epilepsy treatment. *New Scientist*, December 2015
6. Brain Connectivity Leads Girls to Mature Faster than Boys. Daily Telegraph, Daily Mail, Correio Braziliense, Correio do Estado, Irish Independent, Dân Trí, 自由時報, December 2013
7. British Science Festival 2013: Comic about epilepsy and Science Exhibition, September 2013
8. British Science Festival 2013: How did a brain evolve?
9. Strategies for stopping flu spreading. *MIT Technology Review* & Lenta.ru, May 2012
10. Timing is everything. *U.S. News and Bloomberg Business*, January 2011
11. Stopping spreading: One link at a time. BBSRC Business, October 2008
12. Lange Leitungen. *Die Zeit*, 10 August 2006
13. BBC Newcastle radio interview. 1 August 2006
14. Peter Riesbeck: Mobile Eliten. *Berliner Zeitung*, 14 April 2005

INVITED TALKS

Conference organization

Organizer of the symposium 'Brain Connectivity: From Structure to Function' for the annual meeting of the British Neuroscience Association. Liverpool, April 2009.

Invited speaker

7/2024	Hamburg University, Germany
5/2024	Lincoln University, UK
8/2023	Fudan University, Shanghai, China
8/2023	East China Normal University, Shanghai, China
8/2023	Jiao Tong University, Shanghai, China
1/2023	Korea University, Seoul, South Korea

12/2022 Nottingham Trent University, UK
 12/2022 Birmingham University, UK
 11/2022 Cambridge University, UK
 11/2022 ANT-Neuro, Neuromeeting, Berlin, Germany
 9/2022 Ernst Strüngmann Institute, Frankfurt, Germany
 7/2022 City University London, UK
 7/2022 Imperial College London, UK
 5/2022 Newcastle University, UK
 2/2022 NetWorkX Porto, Portugal
 10/2021 Brain Innovation Days, panel discussion
 9/2021 University of Zurich, Switzerland
 4/2021 Unexplored Neuroscience, online seminar
 3/2021 Indian Institute of Technology, B.H.U. Campus, India
 3/2021 Leeds University, UK
 9/2020 Royal Society of Biology, UK
 6/2020 Nottingham University, UK
 5/2020 Keele University, UK
 2/2020 Bristol University, UK
 1/2020 University of Tübingen, Germany
 1/2020 University of Aix-Marseille, France
 12/2019 East China Normal University, Shanghai, China
 11/2019 RWTH Aachen, Medical School, Germany
 10/2019 Shanghai Tech University, iHuman Institute, China
 7/2019 University of Luxembourg, Luxembourg
 7/2019 University of Duisburg-Essen, Germany
 4/2019 East China Normal University, Shanghai, China
 3/2019 EPFL, Lausanne, Switzerland
 3/2019 Blue Brain Project, Campus Biotech, Geneva, Switzerland
 11/2018 Oxford Brookes University, UK
 10/2018 Jiao Tong University, Rui Jin Hospital, China
 2/2018 Nottingham University, UK
 12/2017 East China Normal University, Shanghai, China
 11/2017 Computational Neuroscience Winter School, Antibes, France
 9/2017 Birkbeck University, London, UK
 2/2017 Plymouth University, UK
 12/2016 BrainModes Workshop, Belgium
 8/2016 East China Normal University, Shanghai, China
 6/2016 Intl Conference on Discrete Models of Complex Systems, Aveiro, Portugal
 6/2016 'Bringing Big and Complex Data into Clinical Practice', Munich, Germany
 6/2016 Leeds University, UK
 5/2016 Lake Como Complex Networks Summer School, Italy
 5/2016 York University, UK
 2/2016 Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany
 1/2016 Sussex University, UK
 12/2015 Neuroscience R&D Technologies Conference, Barcelona, Spain
 11/2015 COSMOS EU ITN Workshop, Florence, Italy
 9/2015 Connectome Workbench (Chair of panel discussion), Cambridge, UK
 4/2015 Birmingham University, UK
 3/2015 Porto University, Portugal
 1/2015 Leicester University, UK
 8/2014 Institute of Neuroscience, Chinese Academy of Sciences, Shanghai, China

4/2014 Cambridge University, UK
 10/2013 Nottingham University, UK
 6/2013 King's College London, UK
 4/2013 Manchester University, UK
 4/2013 CERN, Switzerland
 2/2013 Freiburg University, Germany
 5/2012 East China Normal University, Shanghai, China
 2/2012 Warwick University, UK
 2/2012 Nottingham Trent University, UK
 9/2011 North-East Epilepsy Research Meeting, UK
 6/2011 Porto University, Portugal
 5/2011 Hong Kong Baptist University, China
 4/2011 Korea University, South Korea
 2/2011 Bristol University, UK
 8/2010 Max-Planck-Institute for Brain Research, Frankfurt, Germany
 5/2010 RIKEN Brain Science Institute, Tokyo, Japan
 5/2010 Distinguished Lecture Series, Seoul National University, South Korea
 5/2010 National Institute of Mathematical Sciences (NIMS), South Korea
 4/2010 Korean Adv. Institute of Science & Technology (KAIST), South Korea
 1/2010 Cambridge University, Department of Psychology, UK
 11/2009 Workshop: Computational Brain, Leicester, UK
 10/2009 Manchester University, School of Computer Science, UK
 9/2009 International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), Imperial College, London, UK
 9/2009 North-East Epilepsy Research Meeting, UK
 9/2009 Workshop: Mathematics for the Computational Brain, Ambleside, UK
 7/2009 Computational Neuroscience Society (CNS) meeting, Berlin, Germany
 5/2009 Opening Symposium, Department of Brain and Cognitive Sciences, Seoul National University, South Korea
 2/2009 Edinburgh University, School of Informatics, UK
 2/2009 Royal Edinburgh Hospital, UK
 11/2008 Imperial College London, Hammersmith Hospital, fMRI seminar, UK
 11/2008 Imperial College London:
 Workshop 'Complexity and Networks-Neuroscience', UK
 10/2008 SAFECOMP: International Conference on Computer Safety, Reliability and Security (talk and panel discussion), Newcastle, UK
 9/2008 Strathclyde Univ.: Workshop on Complexity in the Brain, Glasgow, UK
 12/2007 Oxford University, John Radcliffe University Hospital, UK
 10/2007 Oxford University, Said Business School, UK
 3/2007 Northwestern Institute of Complex Systems: Complexity Conference, Northwestern University, USA
 3/2007 Max-Planck-Institute for Brain Research, Frankfurt, Germany
 2/2007 Okinawa Institute of Science and Technology, Japan
 1/2007 Santa Fe Institute: Workshop on Network Robustness, New Mexico, USA
 10/2006 Durham University, UK
 8/2006 Edinburgh University, UK
 6/2006 European Bioinformatics Institute: Workshop on Biological Networks, Industry Programme, Cambridge, UK
 4/2006 Aston University, Birmingham, UK
 8/2005 University of Dusseldorf, Dusseldorf, Germany
 10/2004 Neurosciences Institute, San Diego, USA

8/2004 Ruhr-University Bochum, Bochum, Germany
6/2004 Mediterranean Institute for Adv. Studies (IMEDEA), Spain

Conference talks (selected for a talk by programme committees)

2024 Chinese Neuroscience Society Annual Meeting, Suzhou, China
2024 BrainNet workshop, KTH Royal Institute of Technology in Stockholm, Sweden
2023 Computational analysis and modelling for biomedicine, University of Surrey, UK
2023 NIHR UK Stroke Research Workshop, London, UK
2023 Midlands Epilepsy Research Day, Aston University, Birmingham, UK
2022 Advances in Theoretical and Computational Neuroscience, Nottingham, UK
2022 NetSci, Network Neuroscience workshop, Cyberspace
2021 NetSci, Network Neuroscience workshop, Cyberspace
2020 Dynamic Connectome symposium, Frankfurt, Germany
2020 Society of Neurobiology of Language, Cyberspace
2019 Alife Conference, Newcastle upon Tyne, UK
2019 Alzheimer Research UK conference, Harrogate, UK
2018 NetSci Conference, Paris, France
2017 American Epilepsy Society Conference, Washington D.C., USA
2017 European Focused Ultrasound (EUFUS) Conference, Leipzig, Germany
2017 Neurotechnology R&D Conference, London, UK
2017 Bernstein Conference, Göttingen, Germany
2017 NetSci Conference, Indianapolis, USA
2017 3R Meeting, Newcastle upon Tyne, UK
2017 Computing At Schools North East (CASNE), Newcastle upon Tyne, UK
2017 British Neuroscience Association Conference, Birmingham, UK
2017 Computational Neurology Conference, Newcastle upon Tyne, UK
2016 INCF Neuroinformatics Conference, Reading, UK
2016 European Conference for Mathematical and Theoretical Biology, Nottingham, UK
2015 Neuroscience Research Technologies, Barcelona, Spain
2015 ISMAR International Neuroimaging Conference, Shanghai, China
2015 NetSci Conference, Zaragoza, Spain
2014 Computational Neuroscience and Neuroinformatics workshop, Edinburgh, UK
2014 Mathematics of Brain Dynamics workshop, Birmingham University, UK
2013 American Epilepsy Society Annual Meeting, Washington D.C., USA
2012 eFutures: Building Brains Workshop, Edinburgh University, UK
2012 Opening symposium, BCS MRI Center, Seoul National University, Korea
2012 Fusion Science Workshop in Translational Neuroimaging, Korea University, Seoul, Korea
2012 Organization of hierarchical neural networks, Bremen, Germany
2011 NIPS Satellite: Linking Brain Structure to Function, Granada, Spain
2011 Computational Neuroscience Society (CNS) meeting, Stockholm, Sweden
2011 Brain Connectivity Workshop (BCW) annual meeting, Montreal, Canada
2011 British Neuroscience Association (BNA) annual meeting, Harrogate, UK
2010 International Net-Works Conference (keynote speaker), Zaragoza, Spain
2010 UK INCF Neuroinformatics meeting, Edinburgh, UK
2009 British Neuroscience Association (BNA) annual meeting, Liverpool, UK
2009 International Conference on Network Science (NetSci 2009), Venice, Italy
2008 International Conference on Network Science (NetSci 2008), Norwich, UK
2007 Mathematical Neuroscience Network Meeting, Warwick University, UK
2007 Society for Neuroscience Annual Meeting, San Diego, USA
2006 Computational Neuroscience Society - Annual Meeting, Edinburgh, UK

2006 Theoretical Neuroscience Meeting, Bristol, UK
2005 Society for Neuroscience Annual Meeting, Washington D.C., USA
2005 Theoretical Neuroscience Meeting, Loughborough, UK
2004 & 2005 Intl. Conference on Cognitive and Neural Systems (ICCNS), Boston, USA