

Dr.-Ing. Moritz Grosse-Wentrup

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Department Empirical Inference

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Research Interests

Machine Learning: Causal inference; transfer learning; big data; information theoretic learning; network inference; online learning; unsupervised learning; ensemble methods

Biosignal Processing: M/EEG, ECoG, and fMRI decoding; M/EEG source localisation; beamforming; blind source separation; independent component analysis

Neural Prosthetics: Brain-computer interfaces for communication; brain-controlled robotics for motor rehabilitation; neurofeedback

Cognitive Science: The neural basis of cognition; models and disorders of high-level cognition; sensorimotor control and learning; motor disorders; epilepsy detection

Positions

- 2013 – Group Leader (W2)
Max Planck Institute for Intelligent Systems, Department Empirical Inference, Tübingen, Germany
- 2011 – 2013 Project Leader
Max Planck Institute for Intelligent Systems, Department Empirical Inference, Tübingen, Germany
- 2008 – 2010 Research Scientist
Max Planck Institute for Biological Cybernetics, Empirical Inference, Tübingen, Germany

Education

- 2008 Dr.-Ing. in Electrical Eng. & Information Technology
Technische Universität München, München, Germany
Thesis: *Feature Extraction in Non-Invasive Brain-Computer Interfaces*
Committee: K. Diepold, M. Buss, and M. M. Murray (UNIL)
- 2004 Dipl.-Ing. Electrical Eng. & Information Technology
Technische Universität München, München, Germany
Thesis: *ICA: A New Approach for Brain-Computer Interfaces*

2001 – 2002 Visiting Graduate Student
University of Maryland, College Park, USA

Academic Honours and Fellowships

- 2016 IEEE Brain Initiative Best Paper Award
Senior author of Fiebig et al., IEEE SMC 2016 [33]
<http://brain.ieee.org/>
- 2016 – Max Planck ETH Center for Learning Systems
Associated member
<http://learning-systems.org/>
- 2016 – EURASIP-SAT: Biomedical Image & Signal Analysis
Special Area Team, European Association for Signal Processing
<http://www.urasip.org/>
- 2015 – 2016 NIPS Area Chair
Neural Information Processing Systems Conference 2015 & 2016
<http://nips.cc/>
- 2015 – 2018 Chair of PRNI Steering Committee
International Workshop on Pattern Recognition in Neuroimaging
<http://prni.org/>
- 2014 Teaching Award
Awarded by the senior Master's students of the Graduate School of Neural Information Processing, University of Tübingen
<http://www.neuroschool-tuebingen-comput.de/>
- 2014 Best Student Paper Award: International Workshop on Cognitive Information Processing
Senior author of Weichwald et al., CIP 2014 [22]
<http://cip2014.conwiz.dk/>
- 2011 The Annual BCI Research Award 2011
<http://www.bci-award.com/>
- 2007 Chorafas Foundation Award
Best doctoral thesis at Technische Universität München
- 2005 – 2008 Studienstiftung des deutschen Volkes
Doctoral scholarship

Funding History

- 2017 – Federal Ministry of Education and Research (BMBF)
Closed-loop Neurorehabilitation (REHALITY)
Total/PI funding volume: 1,453,218/224,880€

Curriculum Vitae

- 2014 – 2017 Federal Ministry of Education and Research (BMBF)
Associate partner of CorTec Brain-Interchange (MOTOR-BIC)
Total funding volume: 3,997,660€
- 2013 – 2018 Max Planck Institute for Intelligent Systems
Funding for five-year research group: 1,250,000€
- 2010 – 2013 PASCAL2 Network of Excellence
Thematic Programme *Cognitive Inference and Neuroimaging*
Total funding volume: ~25,000€
- 2005 – 2008 German National Academic Foundation
Doctoral scholarship
Total funding volume: ~50,000€

Teaching Experience

- 2015 – Neural Information Processing for BCIs
Graduate course in the Department of Computer Science, Technische Universität Darmstadt, Germany
- 2011 – 2014 Signal Processing
Graduate course at the Graduate School of Neural Information Processing, Eberhard Karls Universität Tübingen, Germany
- 2006 Optimal Control Engineering
Graduate course in the Department of Electrical and Computer Engineering, Technische Universität München, München, Germany
- 2002 – 2003 Signals & Systems
Teaching assistant in an undergraduate course in the Department of Electrical and Computer Engineering, Technische Universität München, München, Germany

Keynotes and Selected Invited Presentations

- 31/10/2017 Keynote at the 5th International Congress on Neurotechnology, Electronics, and Informatics (NEUROTECHNIX 2017)
- 18/04/2017 DALI 2017 Workshop on *Causality: Dialogues between Machine Learning and Psychology*, Tenerife, Spain
- 09/12/2016 NIPS Workshop on *Neurorobotics*, Barcelona, Spain
- 05/09/2016 MEIbioeng 16, Keble College, Oxford, UK
- 26/06/2016 Educational Course on *Pattern Recognition for Neuroimaging*. 22nd Annual Meeting of the Organization for Human Brain Mapping (OHBM), Geneva, Switzerland
- 02/07/2015 Cognitive Science Symposium. TU Darmstadt. Germany

- 14/06/2015 Educational Course on *Pattern Recognition for Neuroimaging*. 21st Annual Meeting of the Organization for Human Brain Mapping (OHBM), Hawaii, USA
- 13/12/2014 Workshop on *Neural Information Dynamics, Causality and Computation Close to Criticality*. Frankfurt Institute for Advanced Studies (FIAS), Frankfurt, Germany
- 08/06/2014 Educational Course on *Pattern Recognition for Neuroimaging*. 20th Annual Meeting of the Organization for Human Brain Mapping (OHBM), Hamburg, Germany
- 17/04/2014 Training School on *Practical Data Analysis and Modeling in Cognitive and Clinical Neuroscience*. Ghent University, Ghent, Belgium
- 26/02/2014 BBCI Winter School on *Neurotechnology*, Berlin, Germany
- 06/06/2013 Workshop on *Teaching the BCI Skill*. International BCI Meeting 2013, Asilomar, USA
- 18/09/2012 Focus Session *Analysis of Oscillatory Brain Activity*. 46th Annual Conference of the German Society for Biomedical Engineering (BMT 2012), Jena, Germany
- 10/12/2011 Bernstein Symposium *Bayesian Inference: From Spikes to Behaviour*, Tübingen, Germany

Publication Summary and Selected Publications

Citations: 1303 (according to Google Scholar on May 7, 2017)
h/i10-index: 19/24

- [1] M. Grosse-Wentrup, D. Janzing, M. Siegel, and B. Schölkopf. Identification of causal relations in neuroimaging data with latent confounders: An instrumental variable approach. *NeuroImage*, 125:825–833, 2016
- [2] V. Jayaram, M. Alamgir, Y. Altun, B. Schölkopf, and M. Grosse-Wentrup. Transfer learning in brain-computer interfaces. *IEEE Computational Intelligence Magazine*, 11(1):20–31, 2016
- [3] T. Fomina, G. Lohmann, M. Erb, T. Ethofer, B. Schölkopf, and M. Grosse-Wentrup. Self-regulation of brain rhythms in the precuneus: A novel BCI paradigm for patients with ALS. *Journal of Neural Engineering*, 13(6), 2016
- [4] S. Weichwald, T. Meyer, O. Özdenizci, B. Schölkopf, T. Ball, and M. Grosse-Wentrup. Causal interpretation rules for encoding and decoding models in neuroimaging. *NeuroImage*, 110:48–59, 2015

- [5] R. Küffner, N. Zach, N. Norel, J. Hawe, D. Schoenfeld, L. Wang, G. Li, L. Fang, L. Mackey, O. Hardiman, M. Cudkowicz, A. Sherman, G. Ertaylan, M. Grosse-Wentrup, T. Hothorn, J. van Ligtenberg, J.H. Macke, T. Meyer, B. Schölkopf, L. Tran, R. Vaughan, G. Stolovitzky, and M.L. Leitner. Crowd-sourced analysis of clinical trial data to predict amyotrophic lateral sclerosis progression. *Nature Biotechnology*, 33(1):51–57, 2015

Full Publication List

Books

- [67] G. Langs, I. Rish, M. Grosse-Wentrup, and B. Murphy. *Machine Learning and Interpretation in Neuroimaging*. Lecture Notes in Computer Science. Springer, 2012

Journal Articles

- [66] O. Özdenizci, M. Yalçın, A. Erdoğan, V. Patoğlu, M. Grosse-Wentrup, and M. Çetin. Electroencephalographic identifiers of motor adaptation learning. *Journal of Neural Engineering*, 2017
- [65] T. Fomina, G. Lohmann, M. Erb, T. Ethofer, B. Schölkopf, and M. Grosse-Wentrup. Self-regulation of brain rhythms in the precuneus: A novel BCI paradigm for patients with ALS. *Journal of Neural Engineering*, 13(6), 2016
- [64] S. Weichwald, M. Grosse-Wentrup, and A. Gretton. MERLiN: Mixture effect recovery in linear networks. *IEEE Journal of Selected Topics in Signal Processing*, 10(7):1254–1266, 2016
- [63] M.R. Hohmann, T. Fomina, V. Jayaram, N. Widmann, C. Förster, J. Just, Synofzik M., B. Schölkopf, L. Schöls, and M. Grosse-Wentrup. A cognitive brain-computer interface for patients with amyotrophic lateral sclerosis. *Progress in Brain Research*, 228:221–239, 2016
- [62] V. Jayaram, M. Alamgir, Y. Altun, B. Schölkopf, and M. Grosse-Wentrup. Transfer learning in brain-computer interfaces. *IEEE Computational Intelligence Magazine*, 11(1):20–31, 2016
- [61] M. Grosse-Wentrup, D. Janzing, M. Siegel, and B. Schölkopf. Identification of causal relations in neuroimaging data with latent confounders: An instrumental variable approach. *NeuroImage*, 125:825–833, 2016
- [60] S. Weichwald, T. Meyer, O. Özdenizci, B. Schölkopf, T. Ball, and M. Grosse-Wentrup. Causal interpretation rules for encoding and decoding models in neuroimaging. *NeuroImage*, 110:48–59, 2015

- [59] R. Küffner, N. Zach, N. Norel, J. Hawe, D. Schoenfeld, L. Wang, G. Li, L. Fang, L. Mackey, O. Hardiman, M. Cudkowicz, A. Sherman, G. Ertaylan, M. Grosse-Wentrup, T. Hothorn, J. van Ligtenberg, J.H. Macke, T. Meyer, B. Schölkopf, L. Tran, R. Vaughan, G. Stolovitzky, and M.L. Leitner. Crowd-sourced analysis of clinical trial data to predict amyotrophic lateral sclerosis progression. *Nature Biotechnology*, 33(1):51–57, 2015
- [58] M. Grosse-Wentrup and B. Schölkopf. A brain–computer interface based on self-regulation of gamma-oscillations in the superior parietal cortex. *Journal of Neural Engineering*, 11(5):056015, 2014
- [57] T. Meyer, J. Peters, T.O. Zander, B. Schölkopf, and M. Grosse-Wentrup. Predicting motor learning performance from electroencephalographic data. *Journal of NeuroEngineering and Rehabilitation*, 11(24), 2014
- [56] D. Janzing, D. Balduzzi, M. Grosse-Wentrup, and B. Schölkopf. Quantifying causal influences. *Annals of Statistics*, 41(5):2263–2702, 2013
- [55] M. Grosse-Wentrup and B. Schölkopf. A review of performance variations in SMR-based brain-computer interfaces (BCIs). In C. Guger, B.Z. Allison, and G. Edlinger, editors, *Brain-Computer Interface Research*, pages 39–51. Springer, 2013
- [54] M. Grosse-Wentrup and B. Schölkopf. High gamma-power predicts performance in sensorimotor-rhythm brain-computer interfaces. *Journal of Neural Engineering*, 55:1991–2000, 2012
- [53] M. Gomez-Rodriguez, J. Peters, J. Hill, B. Schölkopf, A. Gharabaghi, and M. Grosse-Wentrup. Closing the sensorimotor loop: haptic feedback facilitates decoding of motor imagery. *Journal of Neural Engineering*, 8(3):036005, 2011
- [52] M. Grosse-Wentrup, B. Schölkopf, and J. Hill. Causal influence of gamma oscillations on the sensorimotor rhythm. *NeuroImage*, 56(2):837–842, 2011
- [51] M. Grosse-Wentrup, D. Mattia, and K. Oweiss. Using brain–computer interfaces to induce neural plasticity and restore function. *Journal of Neural Engineering*, 8(2):025004, 2011
- [50] D.J. Krusienski, M. Grosse-Wentrup, F. Galán, D. Coyle, K.J. Miller, E. Forney, and C.W. Anderson. Critical issues in state-of-the-art brain–computer interface signal processing. *Journal of Neural Engineering*, 8(2):025002, 2011
- [49] D. Devlaminck, B. Wyns, M. Grosse-Wentrup, G. Otte, and P. Santens. Multisubject learning for common spatial patterns in motor-imagery bci. *Computational Intelligence and Neuroscience*, 2011:8, 2011

- [48] M. Grosse-Wentrup. What are the causes of performance variation in brain-computer interfacing? *International Journal of Bioelectromagnetism*, 13(3):115–116, 2011
- [47] Á. Barbero and M. Grosse-Wentrup. Biased feedback in brain-computer interfaces. *Journal of NeuroEngineering and Rehabilitation*, 7(34):1–4, 2010
- [46] M. Grosse-Wentrup, C. Liefhold, K. Gramann, and M. Buss. Beamforming in non-invasive brain-computer interfaces. *IEEE Transactions on Biomedical Engineering*, 56(4):1209–1219, 2009
- [45] M. Grosse-Wentrup and M. Buss. Multiclass common spatial patterns and information theoretic feature extraction. *IEEE Transactions on Biomedical Engineering*, 55(8):1991–2000, 2008
- [44] A. Neumann, M. Grosse-Wentrup, M. Buss, and K. Gramann. The effect of mutual information on independent component analysis in EEG/MEG analysis: A simulation study. *International Journal of Neuroscience*, 118(11):1534–1546, 2008
- [43] M. Grosse-Wentrup and M. Buss. Overcomplete independent component analysis via linearly constrained minimum variance spatial filtering. *Journal of VLSI Signal Processing*, 48(1–2):161–171, 2007
- [42] M. Grosse-Wentrup and J.L. Contreras-Vidal. The role of the striatum in adaptation learning: A computational model. *Biological Cybernetics*, 96(4):377–388, 2007
- [41] M. Grosse-Wentrup and M. Buss. Subspace identification through blind source separation. *IEEE Signal Processing Letters*, 13(2):100–103, 2006

Peer-Reviewed Conference Publications

- [40] K.-H. Fiebig, V. Jayaram, T. Hesse, A. Blank, J. Peters, and M. Grosse-Wentrup. Bayesian regression for artifact correction in electroencephalography. In *Proceedings of the 7th Graz Brain-Computer Interface Conference 2017*, 2017
- [39] M. Görner, B. Schölkopf, and M. Grosse-Wentrup. Closing one’s eyes affects amplitude modulation but not frequency modulation in a cognitive BCI. In *Proceedings of the 7th Graz Brain-Computer Interface Conference 2017*, 2017
- [38] L. Grossberger, M.R. Hohmann, J. Peters, and M. Grosse-Wentrup. Investigating music imagery as a cognitive paradigm for low-cost brain-computer interfaces. In *Proceedings of the 7th Graz Brain-Computer Interface Conference 2017*, 2017

- [37] J. Moser, M.R. Hohmann, B. Schölkopf, and M. Grosse-Wentrup. A guided task for cognitive brain-computer interfaces. In *Proceedings of the 7th Graz Brain-Computer Interface Conference 2017*, 2017
- [36] O. Özdenizci, M. Yalçın, A. Erdoğan, V. Patoglu, M. Grosse-Wentrup, and M. Çetin. Correlations of motor adaptation learning and modulation of resting-state sensorimotor EEG activity. In *Proceedings of the 7th Graz Brain-Computer Interface Conference 2017*, 2017
- [35] O. Özdenizci, M. Yalçın, A. Erdoğan, V. Patoglu, M. Grosse-Wentrup, and M. Çetin. Pre-movement contralateral EEG low beta power is modulated with motor adaptation learning. In *Proceedings of the 42th International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2017
- [34] S. Weichwald, A. Gretton, B. Schölkopf, and M. Grosse-Wentrup. Recovery of non-linear cause-effect relationships from linearly mixed neuroimaging data. In *Proceedings of the 6th International Workshop on Pattern Recognition in Neuroimaging (PRNI 2016)*, pages 1–4. IEEE, 2016
- [33] K.-H. Fiebig, V. Jayaram, J. Peters, and M. Grosse-Wentrup. Multi-task logistic regression in brain-computer interfaces. In *Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics (SMC 2016)*. IEEE, 2016. (in press)
- [32] O. Özdenizci, M. Yalçın, A. Erdoğan, V. Patoglu, M. Grosse-Wentrup, and M. Çetin. Resting-state EEG correlates of motor learning performance in a force-field adaptation task. In *24th Signal Processing and Communication Application Conference (SIU 2016)*, pages 2253–2256. IEEE, 2016
- [31] V. Jayaram and M. Grosse-Wentrup. A transfer learning approach for adaptive classification in P300 paradigms. In *Proceedings of the International Brain-Computer Interface (BCI) Meeting*, page 2, 2016
- [30] M.R. Hohmann, T. Fomina, V. Jayaram, C. Förster, J. Just, Synofzik M., B. Schölkopf, L. Schöls, and M. Grosse-Wentrup. An improved cognitive brain-computer interface for patients with amyotrophic lateral sclerosis. In *Proceedings of the International Brain-Computer Interface (BCI) Meeting*, page 44, 2016
- [29] M.R. Hohmann, T. Fomina, V. Jayaram, N. Widmann, C. Förster, J. Müller vom Hagen, M. Synofzik, B. Schölkopf, L. Schöls, and M. Grosse-Wentrup. A cognitive brain-computer interface for patients with amyotrophic lateral sclerosis. In *Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics (SMC 2015)*, 2015

- [28] T. Fomina, B. Schölkopf, and M. Grosse-Wentrup. Towards cognitive brain-computer interfaces for patients with amyotrophic lateral sclerosis. In *Proceedings of the 7th Computer Science and Electronic Engineering Conference (CEEC 2015)*, pages 77–80, 2015
- [27] V. Jayaram, N. Widmann, C. Förster, T. Fomina, M.R. Hohmann, J. Müller vom Hagen, M. Synofzik, B. Schölkopf, L. Schöls, and M. Grosse-Wentrup. Brain-computer interfacing in amyotrophic lateral sclerosis: Implications of a resting-state eeg analysis. In *Proceedings of the 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2015)*, pages 6979–6982, 2015
- [26] A. Ibarra Chaoul and M. Grosse-Wentrup. Is breathing rate a confounding variable in brain-computer interfaces (BCIs) based on EEG spectral power? In *Proceedings of the 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2015)*, pages 1079–1082, 2015
- [25] T. Fomina, M.R. Hohmann, B. Schölkopf, and M. Grosse-Wentrup. Identification of the default mode network with electroencephalography. In *Proceedings of the 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2015)*, pages 7566–7569, 2015
- [24] O. Ozdenizci, T. Meyer, M. Cetin, and M. Grosse-Wentrup. Towards neurofeedback training of associative brain areas for stroke rehabilitation. In *International Brain-Computer Interface Conference*, 2014
- [23] S. Weichwald, T. Meyer, B. Schölkopf, T. Ball, and M. Grosse-Wentrup. Causal and anti-causal learning in pattern recognition for neuroimaging. In *2014 International Workshop on Pattern Recognition in Neuroimaging (PRNI)*, pages 1–4, 2014
- [22] S. Weichwald, T. Meyer, B. Schölkopf, T. Ball, and M. Grosse-Wentrup. Decoding index finger position from eeg using random forests. In *Proceedings of the 4th International Workshop on Cognitive Information Processing (CIP 2014)*, pages 1–6, 2014
- [21] M. Grosse-Wentrup, S. Harmeling, T.O. Zander, J. Hill, and B. Schölkopf. How to test the quality of reconstructed sources in independent component analysis (ICA) of EEG/MEG data. In *2013 International Workshop on Pattern Recognition in Neuroimaging (PRNI)*, pages 102–105, 2013
- [20] T.O. Zander, B. Bhattes, B. Schölkopf, and M. Grosse-Wentrup. Towards neurofeedback for improving visual attention. In *Proceedings of the 5th International BCI Meeting*, 2013

- [19] T. Meyer, J. Peters, T.O. Zander, D. Brötz, S.R. Soekadar, B. Schölkopf, and M. Grosse-Wentrup. Investigating the neural basis of brain-computer interface (BCI)-based stroke rehabilitation. In *Proceedings of the International Conference on NeuroRehabilitation (ICNR)*, 2012
- [18] T. Meyer, J. Peters, D. Brötz, T.O. Zander, B. Schölkopf, S.R. Soekadar, and M. Grosse-Wentrup. A brain-robot interface for studying motor learning after stroke. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2012)*, pages 4078–4083, 2012
- [17] M. Grosse-Wentrup. Neurofeedback of fronto-parietal gamma-oscillations. In *Proceedings of the 5th International BCI Conference*, 2011
- [16] M. Grosse-Wentrup. Fronto-parietal gamma-oscillations are a cause of performance variation in brain-computer interfacing. In *5th International IEEE/EMBS Conference on Neural Engineering (NER) 2011*, pages 384–387. IEEE, 2011
- [15] J. Saab, B. Battes, and M. Grosse-Wentrup. Simultaneous EEG recordings with dry and wet electrodes in motor-imagery. In *Proceedings of the 5th International BCI Conference*, 2011
- [14] M. Gomez-Rodriguez, M. Grosse-Wentrup, J. Hill, A. Gharabaghi, B. Schölkopf, and J. Peters. Towards brain-robot interfaces in stroke rehabilitation. In *2011 IEEE International Conference on Rehabilitation Robotics (ICORR)*, pages 1–6. IEEE, 2011
- [13] M. Gomez-Rodriguez, J. Peters, J. Hill, A. Gharabaghi, B. Schölkopf, and M. Grosse-Wentrup. Combining real-time brain-computer interfacing and robot control for stroke rehabilitation. In *Proceedings of the 2nd International Conference on Simulation, Modeling, and Programming for Autonomous Robots (SIMPAN 2010)*, pages 59–63, 2010
- [12] M. Gomez-Rodriguez, J. Peters, J. Hill, B. Schölkopf, A. Gharabaghi, and M. Grosse-Wentrup. Closing the sensorimotor loop: Haptic feedback facilitates decoding of arm movement imagery. In *Proceedings of the 2010 IEEE International Conference on Systems, Man, and Cybernetics (SMC 2010)*, 2010
- [11] M. Gomez-Rodriguez, M. Grosse-Wentrup, J. Peters, G. Naros, J. Hill, B. Schölkopf, and A. Gharabaghi. Epidural ECoG online decoding of arm movement intention in hemiparesis. In *First Workshop on Brain Decoding: Pattern Recognition Challenges in Neuroimaging (WBD)*, pages 36–39. IEEE, 2010

- [10] M. Alamgir, M. Grosse-Wentrup, and Y. Altun. Multitask learning for brain-computer interfaces. In *Proceedings of the Thirteenth International Conference on Artificial Intelligence and Statistics (AISTATS)*, pages 17–24, 2010
- [9] A. Barbero, M. Franz, W. Van Drongelen, J.R. Dorransoro, B. Schölkopf, and M. Grosse-Wentrup. Implicit Wiener series analysis of epileptic seizure recordings. In *Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2009)*, pages 5304–5307, 2009
- [8] M. Grosse-Wentrup. Understanding brain connectivity patterns during motor imagery for brain-computer interfacing. In D. Koller, D. Schuurmans, Y. Bengio, and L. Bottou, editors, *Advances in Neural Information Processing Systems (NIPS 2008)*, pages 561–568. 2009
- [7] S.E. Eren, M. Grosse-Wentrup, and M. Buss. Unsupervised classification for non-invasive brain-computer-interfaces. In *Proceedings of the Automated Workshop (AUTOMED 2007)*, pages 65–66, 2007
- [6] M. Grosse-Wentrup, K. Gramann, and M. Buss. Adaptive spatial filters with predefined region of interest for EEG-based brain-computer-interfaces. In *Advances in Neural Information Processing Systems (NIPS 2006)*, pages 537–544, 2006
- [5] C. Liefhold, M. Grosse-Wentrup, K. Gramann, and M. Buss. Comparison of adaptive spatial filters with heuristic and optimized region of interest for EEG based brain-computer-interfaces. In *Proceedings of the 29th Symposium of the German Association for Pattern Recognition (DAGM 2007)*, pages 274–283. 2007
- [4] P. Breun, M. Grosse-Wentrup, W. Utschick, and M. Buss. Robust MEG source localization of event related potentials: Identifying relevant sources by non-Gaussianity. In *Proceedings of the 28th Symposium of the German Association for Pattern Recognition (DAGM 2006)*, pages 394–403. 2006
- [3] M. Grosse-Wentrup, K. Gramann, E. Wascher, and M. Buss. EEG source localization for brain-computer-interfaces. In *Proceedings of the 2nd International IEEE EMBS Conference on Neural Engineering (NER 2005)*, pages 128–131, 2005

Theses

- [2] M. Grosse-Wentrup. *Feature Extraction in Non-Invasive Brain-Computer Interfaces*. Dr.-Ing. thesis, Technische Universität München, 2008

- [1] M. Grosse-Wentrup. *Independent Component Analysis: A New Approach for Brain-Computer Interfaces*. Dipl.-Ing. thesis, Technische Universität München, 2008

Full List of Invited Presentations

- 25/06/2017 Educational Course on *Pattern Recognition for Neuroimaging*. Annual Meeting of the Organization for Human Brain Mapping (OHBM), Vancouver, Canada
- 04/04/2017 Sensory-Motor Systems Lab, ETH Zurich, Switzerland. Host: Robert Riener.
- 24/01/2017 Good AIfternoon, Department of Artificial Intelligence, Radboud University, Nijmegen, Netherlands
- 18/11/2016 OHBM Alpine Meeting, Salzburg, Austria. Host: Roland Beisteiner
- 06/06/2016 Ernst Strüngmann Institute (ESI) for Neuroscience, Frankfurt, Germany. Host: Pascal Fries
- 25/04/2016 Neurospin, INRIA-CEA, Saclay, France. Host: Bertrand Thirion
- 12/04/2016 Institute for Biomedical Engineering, ETH Zürich. Host: Klaas-Enno Stephan
- 01/02/2016 Center for Neuroprosthetics, EPFL, Lausanne, Switzerland. Host: Dimitri Van De Ville
- 28/09/2015 IEEE German Section, Joint Chapter EMB. Charité, Berlin, Germany. Host: Thomas Penzel
- 24/09/2015 Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany. Host: Arno Villringer
- 06/07/2015 Max Planck Institute of Neurobiology, Martinsried, Germany. Host: Herwig Baier
- 28/05/2015 Brain Imaging Center, Johann Wolfgang Goethe-Universität Frankfurt am Main. Host: Michael Wibral
- 25/12/2014 Department of Psychology, Philipps-Universität Marburg, Marburg, Germany. Host: Dominik Endres
- 10/11/2014 Department of Psychology, University of Toronto, Toronto, Canada. Host: Dirk Bernhardt-Walther
- 02/08/2013 Center for Cognitive Neuroimaging, University of Glasgow, Glasgow, UK. Host: Bashar Awwad Shiekh Hasan
- 22/07/2013 Faculty of Engineering and Natural Sciences, Sabanci University, Istanbul, Turkey. Host: Mujdat Cetin
- 27/06/2013 Department of Psychology, Ohio State University, Columbus, USA. Host: Dirk Bernhardt-Walther

Curriculum Vitae

- 20/06/2013 Department of Biomedical Engineering, Columbia University, New York, USA. Host: Paul Sajda
- 16/04/2013 BrainLinks-BrainTools Colloquium, Albert-Ludwigs-Universität Freiburg, Freiburg, Germany. Host: Tonio Ball
- 05/03/2013 Institute of Cognitive Science, Universität Osnabrück, Osnabrück, Germany. Host: Peter König
- 03/12/2012 Neurology & Neurological Sciences, Stanford School of Medicine, Palo Alto, USA. Host: Jonas Richiardi
- 29/11/2012 Swartz Center for Computational Neuroscience, University of California San Diego, San Diego, USA. Host: Scott Makeig
- 06/06/2012 Graduate School for Computing in Medicine and Life Sciences, University of Lübeck, Lübeck, Germany. Host: Alexander Schläfer
- 16/04/2012 Institute of Medical Psychology and Behavioral Neurobiology, Eberhard-Karls-Universität Tübingen, Tübingen, Germany. Host: Niels Bierbaumer
- 19/03/2012 Parmenides Foundation.
- 29/02/2012 Max Planck Science Gallery Talks, Berlin, Germany.
- 19/01/2012 Department of Software Engineering and Theoretical Computer Science, Technische Universität Berlin, Berlin, Germany. Host: Klaus-Robert Müller
- 18/01/2012 Computer Science Department, Technische Universität Darmstadt, Darmstadt, Germany. Host: Jan Peters
- 02/11/2011 Department of Computer Science, Tokyo Institute of Technology, Tokyo, Japan. Host: Masashi Sugiyama
- 02/03/2010 Wellcome Trust Centre for Neuroimaging, University College London, London, UK. Host: Jean Daunizeau
- 21/02/2010 Joint Symposium on Neural Encoding and Action of Brown University and Eberhard-Karls-Universität Tübingen, Tübingen, Germany.
- 04/12/2009 Department of Electrical and Computer Engineering, Northeastern University, Boston, USA. Host: Deniz Erdogmus.
- 25/09/2009 Dagstuhl Seminar on *Machine Learning Approaches to Statistical Dependences and Causality*, Dagstuhl, Germany.
- 30/10/2008 EU-Project Meeting *BION: Synthetic Pathways to Bio-Inspired Information Processing*, Tübingen, Germany.
- 14/05/2007 Department of Nonlinear Dynamics & Network Dynamics Group, Max Planck Institute for Dynamics & Self-Organization, Göttingen, Germany. Host: Fabian Theis.
- 18/07/2007 Experimental Psychology Unit, Ludwig-Maximilians-Universität München, Munich, Germany. Host: Anna Schubö

Conference & Workshop Organisation

- 10/2017 Designing brain-computer interfaces for users with motor and cognitive disabilities
Special session at the SMC 2017 Workshop on Brain-Machine Interfaces, Banff, Canada. Organised jointly with R. Chavarriaga (EPFL)
- 09/2017 Cloud-based BCIs: challenges and opportunities of home-use systems for big data collection
Workshop at the 7th Graz Brain-Computer Interface Conference, Graz, Austria
- 12/2016 Representation Learning in Artificial & Biological Neural Networks Workshop at the Annual Conference on Neural Information Processing Systems (NIPS 2016), Barcelona, Spain. Organised jointly with L. Wehbe (UC Berkeley), M. Van Gerven (Donders), I. Rish (IBM), B. Murphy (Belfast), G. Langs (Vienna), G. Cecchi (IBM), and A. Nunez-Elizalde (UC Berkeley)
<https://sites.google.com/site/mlini2016nips/>
- 06/2016 What Neuroimaging Can Tell Us? From Correlation to Causation and Cognitive Ontologies
Symposium at the 22nd Annual Meeting of the Organization for Human Brain Mapping (OHBM), Geneva, Switzerland. Organised jointly with R. Poldrack (Stanford), M. Lindquist (Johns Hopkins), and C. Hermann (Oldenburg)
<http://www.humanbrainmapping.org/>
- 12/2015 Machine Learning and Interpretation in Neuroimaging (MLINI 2015). Workshop at the Annual Conference on Neural Information Processing Systems (NIPS 2015), Montréal, Canada. Organised jointly with G. Cecchi (IBM), K.K. Chang (CMU), G. Langs (Vienna), B. Murphy (CMU), I. Rish (IBM), and L. Wehbe (Berkeley)
<https://sites.google.com/site/mliniworkshop2015>
- 06/2014 4th International Workshop on Pattern Recognition in Neuroimaging (PRNI 2014)
General and local chair. Organised jointly with M. van Gerven (Donders Institute) and N. Koutsouleris (LMU)
<http://www.prni.org>
- 12/2012 Machine Learning and Interpretation in Neuroimaging (MLINI 2012)
Workshop at the Annual Conference on Neural Information Processing Systems (NIPS 2012), Lake Tahoe, Nevada, USA. Organised jointly with G. Cecchi (IBM), K.K. Chang (CMU), G. Langs (Vienna), B. Menze (ETH), B. Murphy (CMU) and I. Rish (IBM)
<https://sites.google.com/site/nipsmlini2012/>

Curriculum Vitae

- 07/2012 2nd International Workshop on Pattern Recognition in Neuroimaging (PRNI 2012)
Joint general chair with J. Mourao-Miranda (UCL), D. Van De Ville (EPFL) and C. Davatzikos (UPenn)
<http://www.mlnl.cs.ucl.ac.uk/prni2012/>
- 12/2011 Machine Learning and Interpretation in Neuroimaging (MLINI 2011)
Workshop at the 26th Annual Conference on Neural Information Processing Systems (NIPS 2011), Granada, Spain. Organised jointly with J. Murao-Miranda (UCL), V. Murino (Verona), I. Rish (IBM), and G. Langs (Vienna)
<https://sites.google.com/site/mlini2011/>
- 09/2011 Operationalisation of Mental States
Interdisciplinary summer school, University of Tübingen.
<http://www.forum-scientiarum.uni-tuebingen.de/de/lehrangebot/akademien/archiv/sa-2011/index.html>
- 2010 – 2013 PASCAL2 Thematic Programme: Cognitive Inference and Neuroimaging
Founder and Programme Manager. Organised jointly with J. Mourao-Miranda (UCL) and V. Murino (Verona).
<http://mlin.kyb.tuebingen.mpg.de/>
- 06/2010 Using Brain-Computer Interfacing Systems to Induce Neural Plasticity and Restore Function
Workshop at the 4th International Meeting on Brain-Computer Interfaces, Asilomar, USA. Organised jointly with K. Oweiss (Michigan State University) and D. Mattia (Fondazione Santa Lucia)
- 12/2009 NIPS Workshop: Connectivity Inference in Neuroimaging
Workshop at the 24th Annual Conference on Neural Information Processing Systems (NIPS 2009), Whistler, Canada. Organised jointly with U. Noppeney (MPI), B. Schölkopf (MPI), and K. Friston (UCL)
<http://cini2009.kyb.tuebingen.mpg.de/>

Reviewing

- Journals** Proceedings of the National Academy of Sciences, Journal of Neural Engineering, IEEE Transactions on Neural Systems and Rehabilitation Engineering, IEEE Transactions on Biomedical Engineering, Nature Scientific Reports, IEEE Signal Processing Letters, IEEE Sensors Journal, IEEE Transactions on Haptics, IEEE Transactions on Neural Networks, IEEE Transactions on Robotics, NeuroImage, PLoS Computational Biology, Journal of Neuroengineering and Rehabilitation, Scientific Reports, Journal of Neuroscience Methods, Neurocomputing, PLoS One, Brain-Computer Interfaces.
- Conferences** Neural Information Processing Systems (NIPS), International Conference on Machine Learning (ICML), Uncertainty in Artificial Intelligence (UAI), Artificial Intelligence and Statistics (AISTATS), IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), International Conference on Biomedical and Health Informatics (BHI), IEEE EMBS Neural Engineering Conference (NER), International BCI Conference, International Workshop on Pattern Recognition in Neuroimaging (PRNI), Annual Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), Robotics: Science and Systems (RSS), IEEE International Conference on Robotics and Automation (ICRA), Snowbird Workshop, American Control Conference (ACC), European Control Conference (ECC), Fachtagung Biomedizinische Technik (BMT), IEEE Conference on Decision and Control (CDC)
- Other** Deutsche Forschungsgemeinschaft (DFG), The Annual BCI Research Award, A*STAR President's Science and Technology Award, Technology Foundation STW, Research Foundation - Flanders (FWO), Wellcome Trust, UK Medical Research Council (MRC)

Major Collaborations

Herwig Baier	Max Planck Institute of Neurobiology, Germany
Tonio Ball	Albert-Ludwigs-Universität Freiburg, Germany
Dirk Bernhardt-Walther	University of Toronto, Canada
Müjdat Çetin	Sabancı University, Istanbul, Turkey
Arthur Gretton	Gatsby Unit, University College London, UK
Jan Peters	Technische Universität Darmstadt, Germany
Bernhard Schölkopf	Max Planck Institute for Intelligent Systems, Tübingen
Markus Siegel	Eberhard Karls Universität Tübingen, Germany

Supervision

- 2017 – Atalanti Mastakouri (Ph.D. student; Max Planck Institute for Intelligent Systems)
Personalised neurorehabilitation
- 2015 – Sebastian Weichwald (Ph.D. student; Max Planck Institute for Intelligent Systems)
Causal inference in cognitive neuroimaging
- 2015 – Matthias Hohmann (Ph.D. student; Max Planck Institute for Intelligent Systems)
Crowdsourcing for brain-computer interfacing
- 2014 – Vinay Jayaram (Ph.D. student; Max Planck Institute for Intelligent Systems)
Transfer learning
- 2012 – 2017 Tatiana Fomina (Ph.D. student; Max Planck Institute for Intelligent Systems)
Brain-computer interfaces for communication in locked-in syndrome
- 2011 – 2012 Thorsten Zander (Postdoc; Max Planck Institute for Intelligent Systems)
- 2011 – 2015 Timm Meyer (Ph.D. student; Max Planck Institute for Intelligent Systems)
Brain-computer interfaces for stroke rehabilitation
- 2009 – 2011 Manuel Gomez-Rodriguez (Ph.D. student; Stanford University & Max Planck Institute for Biological Cybernetics)
Brain-robot interfaces for rehabilitation of patients with severe motor deficits