

PD Dr. habil Thomas R. Knösche

- Group leader at **Max Planck Institute for Human Cognitive and Brain Sciences**, Leipzig, Germany
- Docent at **Technical University Ilmenau**, Germany

Education

Diploma	1992, Electrical Engineering, TU Ilmenau
Doctorate	1997, Applied Physics, TU Twente (Netherlands)
Habilitation	2010, Biomedical Engineering, TU Ilmenau



Employment

1992 – 1996	PhD student, TU Ilmenau and TU Twente, Netherlands
1997 – 1998	Postdoctoral researcher at MPI for Neuropsychological Research, Leipzig
1999 – 2001	R&D manager of A.N.T. Software B.V., Enschede, Netherlands
2001 – 2006	Researcher at MPI for Human Cognitive and Brain Sciences
2006 – today	Head of research group „Cortical Networks and Cognitive Functions“

Teaching (selection)

- From 2006: Organization of International Summerschool in Biomedical Engineering.
- From 2006: TU Ilmenau, Uni Leipzig: Special lectures on measurement and analysis of electric and magnetic signals of the brain.
- From 2010: International Max Planck Research School NeuroCom (MPI Leipzig): Course on Brain imaging methods.
- 2005-2008: University of Halle-Wittenberg: Curricular Lecture *Biological Psychology*.
- From 2012: TU Ilmenau: Curricular *Lecture Introduction to Neuroscience*.
- Supervision of 12 PhD and 6 Master students.

Research Interests and Expertise

- Computational modelling of neural networks, neural mass modelling.
- Biophysical modelling of EEG/MEG, in particular source reconstruction.
- Diffusion tractography.
- Neurocognition of language and music .

Grants (selection)

- 2006 – 2009 „Development and validation of methods for the localization of brain activity using finite elements“ (German Research Foundation, DFG, KN588/2)
- 2007 – 2010 „Functional organization of brain activity – robustness of connectivity in the sources space of neuroelectromagnetic signals“ (German Research Foundation, DFG, KN588/3)
- 2007 – 2010 „Cortical networks and cognitive functions“ (Max Planck Society – Interinstitutional Research Initiative)
- 2009 – 2010 „Interactive visualization of highly complex structural and functional data from medicine and neuroscience“ (German Ministry of Economics, AiF, KF2034701SS8)
- 2009 – 2012 „Consortium of Neuroimagers for the Non-invasive Exploration of Brain Connectivity and Tractography“ (European Union, FP7-ICT-2007-C)
- 2011 – 2013 „Development, validation and application of methods for the determination of connectivity between brain structures“ (German Research Foundation, DFG, KN588/4-1)
- 2011 – 2014 „Multimodal neuronavigation system for the integration of transcranial magnetic stimulation with the visualization of nerve fiber pathways“ (German Ministry of Economics, AiF, KF2034702KJ1)

- 2014 – 2016 „Development of an innovative technology for reliable and fast computation of standardized EEG based on high-resolution measurements” (German Ministry of Economics, AiF, KF2034703 KJ3)

Publications (selection)

(70 peer reviewed journal papers, h-index 31, about 250 conference papers)

Knösche, Anwander, Liptrot, Dyrby: Validation of tractography – comparison with manganese tracing. *Human Brain Mapping*, 36(10):4116-34 (2015)

Cho, Vorwerk, Wolters, Knösche: Influence of the head model on EEG and MEG source connectivity analysis. *NeuroImage* 110, 60-77 (2015)

Riffert, Schreiber, Anwander, Knösche: Beyond fractional anisotropy: extraction of bundle-specific structural metrics from crossing fiber models. *NeuroImage* 100, 176–191 (2014)

Moreno-Dominguez, Anwander, Knösche: A Hierarchical Method for Whole-Brain Connectivity-Based Parcellation. *Human Brain Mapping* 35, 5000–5025 (2014)

Schreiber, Riffert, Anwander, Knösche: Plausibility Tracking: A method to evaluate anatomical connectivity and microstructural properties along fiber pathways. *NeuroImage* 90, 163-178 (2014)

Ruschel, Knösche, Friederici, Turner, Geyer, Anwander: Connectivity architecture and subdivision of the human inferior parietal cortex revealed by diffusion MRI. *Cerebral Cortex* 24(9): 2436-2448 (2014)

Wang, T.Knösche: A realistic neural mass model of the cortex with laminar-specific connections and synaptic plasticity – evaluation with auditory habituation, *PLoS ONE* 8(10) e77876 (2013)

Jones, Knösche, Turner: White matter integrity, fiber count, and other fallacies: the do’s and don’t’s of diffusion MRI. *NeuroImage*, 73, 239-54 (2013)

Knösche, Gräser, Anwander: Prior knowledge on cortex organization in the reconstruction of source current densities from EEG. *NeuroImage* 67, 7-24 (2013)

Dannhauer, Lämmel, Wolters, Knösche: Spatio-temporal regularization in linear distributed source reconstruction from EEG/MEG – A Critical Evaluation, *Brain Topography* 26(2), 229-246 (2013)

Heidemann, Anwander, Feiweier, Knösche, Turner: k-space and q-space: Combining ultrahigh spatial and angular resolution in diffusion imaging using ZOOPPA at 7T. *NeuroImage* 60(2), 967-978 (2012)

Dannhauer, Lanfer, Wolters, Knösche: Modelling the human skull in EEG source analysis, *Human Brain Mapping* 32(9), 1383-1399 (2011)

Macedonia, Knösche: Body in mind: How gestures empower foreign language learning, *Mind, Brain and Education* 5(4), 196-211 (2011)

Knösche, Tittgemeyer: The role of long-range connectivity for the characterization of the functional-anatomical organization of the cortex, *Frontiers in System Neuroscience* 5:58. (Epub 2011)

Spiegler, Knösche, Schwab, Haueisen, Atay: Modeling brain resonance phenomena using a neural mass model, *PLoS Computational Biology*, 7(12) (2011)

Spiegler, Kiebel, Atay, Knösche: Bifurcation analysis of neural mass models: impact of extrinsic inputs and dendritic time constants. *NeuroImage* 52(3), 1041-1058 (2010)

Descoteaux, Deriche, Knösche, Anwander: Deterministic and probabilistic tractography based on complex fiber orientation distributions, *IEEE-Transactions on Medical Imaging* 28, 269-286 (2009)

Nan, Knösche, Friederici: Non-musicians’ perception of phrase boundaries in music: a cross-cultural ERP study, *Biological Psychology* 82(1), 70-81 (2009)

Anwander, Tittgemeyer, Friederici, von Cramon, Knösche: Connectivity-based cortex parcellation of Broca’s area, *Cerebral Cortex* 17(4), 816-825 (2007)

Kaden, Knösche, Anwander: Parametric spherical deconvolution: Inferring anatomical connectivity using diffusion MR imaging, *NeuroImage* 37, 474-488 (2007)

Knösche, Neuhaus, Haueisen, Alter, Maess, Friederici, Witte: The perception of phrase structure in music, *Human Brain Mapping* 24 (4) 259-273 (2005)

Haueisen, Knösche: Involuntary Motor Activation in Pianists Evoked by Music Perception, *Journal of Cognitive Neuroscience* 13: 786-792 (2001)