Curriculum Vitae
Friedrich T. Sommer

Current Address:
Redwood Center for Theoretical Neuroscience
University of California, Berkeley
132 Barker
Berkeley, CA 94720-3190, USA
Phone: +1 510 642 7251; FAX : +1 510 642 7206
Email: fsommer@berkeley.edu

Current Position:

2005-present Associate Adjunct Professor, Helen Wills Neuroscience Institute & Redwood Center for Theoretical Neuroscience, University of California, Berkeley

2002-present Faculty member (Privatdozent), Computer Science Department, University of Ulm

Education:

Degrees

2002 Habilitation, Computer Science, University of Ulm

1993 Ph.D., Physics, University of Düsseldorf

1987 Diploma in Physics, University of Tübingen

Postdoctoral Fellowships

1994-1995 Section of Experimental Magnetic Resonance of the Central Nervous System, University of Tübingen

1993-1994 Department of Neural Information Processing, University of Ulm

Professional Experience:

1 – 6 /2009 Acting Director of the Redwood Center for Theoretical Neuroscience, University of California, Berkeley

6 – 12/2007 Acting Director of the Redwood Center for Theoretical Neuroscience, University of California, Berkeley

2002-2005 Principal Investigator, Redwood Neuroscience Institute, Menlo Park, CA, USA

2004-2005 Visiting Scholar, Helen Wills Neuroscience Institute, University of Berkeley, USA

1996-2002 Assistant Professor, Computer Science Department, University of Ulm, Germany

1999 Visiting scholar, Brain & Cognitive Science Department, MIT, Boston, USA

1995-1996 Staff Scientist, Institute of Medical Psychology & Department of Neuroradiology, University of Tübingen, Germany

1993-1995 Research Associate, Computer Science Department, University of Ulm, Germany

1988-1993 Research Assistant, Vogt-Institute of Brain Research and Neuroanatomy, University of Düsseldorf, Germany

Membership in Academic Societies

1986 - German/European Physical Society (DPG)

2003 - Society for Neuroscience

Funding Support:

Intramural Awards

1999-2001 Funding for Ph.D. project, University of Ulm

1997-1998 Funding for Ph.D. project, University of Tübingen

Extramural Awards

2009-2013 CRCNS.ORG – Online repository for high-quality neuroscience data and resources for computational neuroscience. National Science Foundation, Award number CNS-0855272
Principal Investigator

2007-2010 Exploring neurobiological strategies of visual scene analysis using oscillations in recurrent neural circuitry. National Science Foundation, Award number IIS-0713657
Principal Investigator

2007-2009 CRCNS data sharing: Central facility and services. National Science Foundation, Award number IIS-0749049
Principal Investigator (CoPI: Bruno A.Olshausen)

2007-2008 Google research award

2005-2008 Research Award, Strauss Hawkins Trust

1999-2002 German governmental research award (funds 1 PI and 1 Postdoc position)
Principal Investigator

1999-2000 Ph.D. student salary, German Society of Endomitriosis

1996-1999 Habilitation-Fellowship of the German Research Foundation (DFG)

Teaching Experience:

Invited lectures

2010 Lecture at CSHL Banbury seminar on Computational Neuroscience – Vision, Banbury Center, Long Island

2010 Lecture at the Symposium "Beyond Neural Cartography", University of Southern California, Los Angeles

2009 Lecture at the Graduiertenkolleg, University of Ulm, Ulm 2/2009

2006 Graduate lecture on V1 and sparse coding, University of Southern California, Los Angeles

2001 Exploratory data analysis in functional neuroimaging. Lecture at the 3rd Tutorial on Neuro-fMRI, Tuebingen, Germany 3/2001

2000 Multivariate methods of data analysis in functional neuroimaging. Lecture at the 2nd Tutorial on Neuro-fMRI, Tuebingen, Germany 3/2000

Lecture Courses

2009 *Computational Neuroscience* (*MCB262),*University of California Berkeley, One of 5 lecturers

2008 Neural Computation (VS298), University of California Berkeley, One of 3 lecturers

2007 *Computational Neuroscience* (*MCB262),*University of California Berkeley, One of 6 lecturers

2006 Neural Computation (VS298), University of California Berkeley, One of 3 lecturers

2005 *Computational Neuroscience* (*MCB262/PSYCH290P),*University of California Berkeley, One of 6 lecturers

2005 *Statistics of natural stimuli, a potential key to brain function,*
University of Ulm, Lecturer

2003 *Computational Neuroscience* (*MCB262/PSYCH290P),*University of California Berkeley, One of 4 Lecturers

2002 *Information Retrieval and Associative Memories,* University of Ulm, Lecturer

2001 *Computational Neuroscience,* University of Ulm, Lecturer

2000 *Theoretical Methods for the Interpretation of Medical Functional Imaging Data* University of Ulm, Lecturer

1998 & 2000 *Information Retrieval,* University of Ulm, Lecturer

1997 & 1998 *Associative Memories: Conventional and Neural,* University of Ulm, Lecturer

1997 *Neural Cell Assemblies,* University of Ulm, One of 2 Lecturers

Teaching Assistance

1988 – 1993 *Graduate courses "Theory of Neural Networks",* University of Düsseldorf

1986 *Undergraduate course "Theoretical Thermodynamics",* University of Tübingen

1985 *Undergraduate course "Theoretical Electrodynamics",* University of Tübingen

Students and Fellows:

Honors Thesis Student

2009-2010 Evan Ehrenberg, UC Berkeley – **Thesis won Glushko Price 2010**

Master Students

2007-2009 Will Coulter, Masters in Neuroscience, UC Berkeley

2000-2002 Volker Schmitt, Diploma Thesis 2002, University of Ulm

1997-1999 Urs Vollmer, Diploma Thesis 1999, University of Ulm

1997-1999 Thomas Gunsch, Diploma Thesis 1999, University of Ulm

Ph.D. Students

2008- present Daniel Little, doctoral candidate, UC Berkeley

2004-present Vishal Vaingankar, doctoral candidate, University of Southern California (co-advisor)

2003-2010 Xin Wang, doctoral candidate, University of Southern California (co-advisor)

2003-2005 Martin Rehn, doctoral candidate, Royal Institute of Technology, Stockholm (co-advisor)

1999-2004 Andreas Knoblauch, Ph. D. 2004, University of Ulm (co-advisor)

1997-2002 Axel Baune, Ph. D. 2002, University of Ulm

1994-1997 Wolfgang Kopold, Ph. D. 1997, University of Ulm (co-advisor)

Post Graduate Fellows

2010-present Reza Moazzezi, Ph. D. UC Berkeley

2009-present Chris Hillar, Ph.D., UC Berkeley

2007-2009 Gianluca Monaci, Ph.D., UC Berkeley

2007-2008 Martin Rehn, Ph.D., Google and UC Berkeley

2006-present Kilian Koepsell, Ph. D., UC Berkeley

1999-2003 Andrzej Wichert, Ph.D., University of Ulm

University Service:

Doctoral Committees

2010 Xundong Wu, University of Southern California

2010 Channing Moore, UC Berkeley

2005 Dr. Christopher Tengrove, University of Technology, Sydney, Australia

2004 Dr. Andreas Knoblauch, University of Ulm, Germany

2004 Dr. Anders Sandberg, Royal Institute of Technology, Stockholm, Sweden

2001 Dr. Usha Sreedevi Sridar, University of Sydney, Australia

2000 Dr. Gracia Del Rosario, Saybrook Research Center, San Francisco, USA

Committees for Qualifying Exams

2008 Channing Moore, Department of Psychology, UC Berkeley

2006 Sangita Dandekar, School of Optometry, UC Berkeley

2007 Jimmy Wang, School of Optometry, UC Berkeley

2007 Amir Khosrowshahi, School of Optometry, UC Berkeley

Miscellaneous

2008-present UC Berkeley Amateur Radio Club, Trustee and coordinator for the involvement of this group in campus emergency preparedness

2000 Imaging Center Development, University of Ulm, Planning Committee

1996-1999 Interdisciplinary seminar series on Theoretical Neuroscience at the Universities of Tübingen and Ulm, Organizer

1994 Exhibit of neural hardware for information retrieval, representing University of Ulm at CeBit, Hannover, Germany, Presenter

1989-1991 Interdisciplinary seminar series on "Brain and Mind", University of Düsseldorf, Organizer

Public service: scientific journals, conferences, educational and governmental agencies:

Journal Reviews
Biological Cybernetics
Frontiers in Neuroscience
Human Brain Mapping
International Journal of Neural Systems
Journal of Theoretical Medicine
Journal of Computational Neuroscience
Journal of Machine Learning Research
Journal of Neural Engineering
Journal of Neuroscience
Journal of Vision
Network: Computation in Neural Systems
Neural Networks
Neural Computation
Neurocomputing
NeuroImage
NMR in Biomedicine
Physics Letters A
Physiological Measurement (IOP)
Public Library of Science – Biology
Public Library of Science – Computational Biology
Proceedings of the National Academy of Sciences, USA
IEEE Signal Processing Letters
IEEE Transactions onm Information Theory
IEEE Transactions on Neural Networks
IT-Information Technology
Science
SIAM Journal on Applied Mathematics
Theory in Biosciences

Editorial Boards
Frontiers in Neuroscience (Review editor, Neuroinformatics)

National Science Foundation
Review Panelist (Computing Research Infrastructure) 11/2007

Conference organization
2011 International conference *Neuroinformatics*, Boston, MA, member of program committee

2010 International conference *Computational and Systems Neuroscience (CoSyNe)*, Reviewer

2010 International conference *Neural Information Processing (NIPS)*, Reviewer

2009 International conference *Computational and Systems Neuroscience (CoSyNe)*, Reviewer

2009 International conference *Neural Information Processing (NIPS)*, Reviewer

2008 International conference *Computational and Systems Neuroscience (CoSyNe)*, Workshop Chair

2007 International conference *Computational and Systems Neuroscience (CoSyNe)*, Workshop Chair

2005 International conference *Neural Information Processing (NIPS)*, Program Chair

2003 Workshop *Inference and Prediction in Neocortical Circuits*, Palo Alto, CA, sponsored by AIM, NSF and RNI, Planning Committee

2002 European Conference on Artificial Intelligence (ECAI), Lyon, France, Reviewer

2001 Annual Conference of the Cognitive Science Society, Edinburgh, UK, Reviewer

2000 International Joint Conference on Neural Networks (IJCNN), Como, Italy, Reviewer

1999 Fest-Symposium for Guenther Palm, University of Ulm, Germany, Organizer

1998 "Local and global information processing in the cortex" Schloss Reisensburg, Günzburg, Germany, Planning Committee

Workshop organization
2010 Perception & Action – An interdisciplinary approach to cognitive systems theory. Co-organizer

2008 Data sharing and modeling challenges in Neuroscience – a first step towards predictive neuron models, CoSyNe conference, Workshop Organizer

2005 Redwood Center Inaugural Symposium, University of California, Berkeley, Chair and Planning Committee

2003 Inference and prediction in neocortical circuits, American Institute of Mathematics, Palo Alto, Planning Committee

2002 Neural assemblies: development in theory and experiment, Computational Neuroscience Conference (CNS), Chicago, IL, 2002 (Proceedings published in Theory in Biosciences), Workshop Organizer

2000 Explorative analysis and data modeling in functional neuroimaging. Neural Infromation Processing Conference (NIPS), (Proceedings published by the MIT Press), Workshop Organizer

National and International Lectures

Talk at the workshop "Determinants of functional biases in sensory tuning across cortical laminae and regions", CoSyNe, Snowbird, UT, USA 2/2010

Talk at the workshop "Synchronization and Multiscale Complex Dynamics in the Brain", Dresden, Germany 11/2009

Talk at Johns Hopkins University, Baltimore, USA 9/2009

Talk at CNS conference, Berlin, Germany 7/2009

Talk at workshop "Structure and Dynamics of Networks", Blaubeuren, Germany 7/2009

Talk at CRCNS-PI meeting, CMU/U. Pittsburgh, Pittsburgh, USA 6/2009

Talk at Joint Symposium on Neural Computation, Los Angeles, USA 5/2009

Talk at Computational Neuroscience Group at Universitat Pompeu Fabra, Barcelona, Spain 3/2009

Talk at Bernstein Center for Theoretical Neuroscience, Ludwig-Maximilians Universität München, Germany 2/2009

Talk at Center for Neurobiology and Behavior, Columbia University, New York, USA 1/2009

Talk at the 1st INCF Workshop on Time Series Data: Analysis and Management, Stockholm, Sweden 12/2008

How network dynamics in early visual stages can form sensory representations. Invited talk at University of Nijmegen, The Netherlands 7/2008

Roles of dynamical processes in early visual stages for forming sensory representations. Invited talk at the Ladislav Tauc conference "Complexity in Neural Network Dynamics", Gif sur Yvette, France 12/2007

Can high-level perception use dynamical processes in early visual stages? Invited talk at the workshop on High-level perception and low-level vision: Bridging the semantic gap. Santa Fe Institute, Santa Fe, NM, USA 10/2007

Retinal oscillations carry visual information to cortex. Conference of the Biomedical Engineering Society, Los Angeles, CA, 9/2007

Modeling spike trains and the transmission of information in LGN. Invited talk at the workshop Quantitative Neuron Modeling, EPFL, Lausanne, Switzerland, 6/2007

Spike timings relative to retinal oscillations carry visual information to cortex. Invited talk at the Brain Network Dynamics Conference, Berkeley, CA, USA 3/2007

In what sense should visual representations be sparse? Honda Research & Development Europe, GmbH, Frankfurt, Germany 2/2006

Theoretical approaches for understanding neural representation and memory in the brain. CBB Seminar, University of California, Berkeley, CA, USA 9/2005

A Model for binary sparse coding of visual input can explain the shape diversity of simple cell receptive fields. Empirical Inference Symposium. Max Planck Institute for Biological Cybernetics, Tübingen, Germany, 8/2005

Testing cell assemblies with fMRI. Computational Neuroimaging Workshop, Organizers: B. Wandell and K. Grill-Spector, Stanford University, Palo Alto, CA, USA, 7/2004

Cortical inference with sparse associative memories. Workshop of the Canadian Institute of Advanced Research, Organizer: Geoffrey Hinton, Vancouver, Canada, 12/2003

Associative memory with spiking neurons. Workshop "Inference and prediction in the cortex" American Institute of Mathematics, Palo Alto, CA, USA, 9/2003

Cell assemblies and associative memories. Department of Biomedical Engineering, University of Southern California, Los Angeles, CA, USA, 11/2002

Associative memory in neuronal networks: spatial and temporal coding. Workshop at the Computational Neuroscience Conference. Chicago, IL, USA, 7/2002

Exploratory data analysis in event-related fMRI: Application on working memory. Department of Diagnostic Radiology and Applied Physics, Yale University, New Heaven, CT, USA 7/2001

Dynamical cluster analysis for fMRI. Workshop at the Neural Information Processing Systems (NIPS) Conference, Denver, CO, USA 12/2000

Analysis and Bayesian foundation of associative memory models. Max Planck Institute of Mathematics in the Sciences, Leipzig, Germany 7/2000

Activation processes and information processing in the brain. University of Aachen, Germany, 5/1999

Adaptive cluster analysis of functional magnetic resonance data. University of Düsseldorf, Germany 3/1999

Improved retrieval in associative memories. Division of System & Circuit Technology, Heinz Nixdorf Institute, University of Paderborn, Germany 11/1998

Cell assemblies and associative memory. Department of Brain and Cognitive Science, MIT, Boston, MA, USA 5/1998

Mechanisms of memory in the brain. Division of Applied Mathematics/Neuroscience Department, Brown University, Providence, RI, USA 4/1998

Neural associative memories: Models derived from probabilistic reasoning. Center for Biological and Computational Learning, MIT, Boston, MA, USA 3/1998

Simulation of a cortical network using anatomical data. (Invited Talk) Workshop on Information Processing in Cells and Tissues, IPCAT96, Düsseldorf, Germany 10/1996

Cell assemblies, associative memory and back. Max Planck Institute of Psychological Research, Munich, Germany, 3/1996

Neural information processing with local synaptic learning rules. Department of Psychology, University of Tübingen, Germany 11/1995

Iterative retrieval in associative memory. Computer Science Faculty, Technical University Munich, Germany, 11/1994

Neural associative memories as modules for information processing systems. Workshop "Neuronales Lernen", CoWAN '94, Technical University Cottbus, Germany, 10/1994

Iterative Retrieval of Sparsely Coded Associative Memory Patterns. NeuroNet '93 Conference, Prague, Chech Republic, 9/1993

Definitions and results of information capacity for associative memories. Symposium on Physics of Neural Networks, Bad Honnef, Germany, 2/1992

Publications:

Books

1. Sommer F. T., Wichert A., Editors (2003) Exploratory analysis and data modeling in functional neuroimaging. MIT Press, Cambridge, MA, ISBN 0-262-19481-3

2. Sommer F. T. (1994) Theorie neuronaler Assoziativspeicher – Lokales Lernen und iteratives Retrieval von Information. Hänsel-Hohenhausen, Egelsbach, ISBN 3-89349-901-6

Popular Science Writings

1. Sommer F. T. (2010) Associative memory and learning. *Encyclopedia of the Sciences of Learning,* Springer Verlag (in the press)

2. Sommer F. T. (2007) Bunte Theorien für graue Zellen. *Gehirn und Geist* 6/2007: 70-76. Spektrum der Wissenschaften Verlag

Journal Articles

1. Koepsell, K., Wang X., Hirsch, J. A., Sommer F. T. (2010) Exploring the function of neural oscillations in early sensory systems. Focused review in *Frontiers in Neuroscience* 4: 53-61

2. Knoblauch, A. Palm, G., Sommer F. T. (2010) Memory capacities for synaptic and structural plasticity. *Neural Computation* 22: 289-341

3. G. Monaci, P. Vandergheynst, F. T. Sommer (2009) Learning bimodal structure in audio-visual data. *IEEE Transactions on Neural Networks* 20: 1898-1910

4. Koepsell, K., Wang, X., Vaingankar, V., Wei, Y., Wang, Q., Rathbun, D. L., Usrey, Hirsch, J. A., Sommer F. T. (2009) Retinal oscillations carry visual information to cortex. *Frontiers in Systems Neuroscience* 3:4

5. Koepsell, K., Sommer, F.T. (2008) Information transmission in oscillatory neural activity. *Biological Cybernetics* 99: 403-416

6. Teeters, J. L., Harris, K.D., Millman, K.J., Olshausen, B.A., Sommer, F.T. (2008) Data sharing for computational neuroscience. *Neuroinformatics* DOI 10.1007/s12021-008-9009-y

7. Wang, X., Wie, Y., Vaingankar, V., Wang, Q., Koepsell, K., Sommer, F. T., Hirsch, J. A. (2007) Feedforward excitation and inhibition evoke dual modes of firing in the cat's visual thalamus using naturalistic viewing. *Neuron* 55(3): 465-478

8. Rehn, M., Sommer, F. T. (2007) A network that uses few active neurones to code visual input predicts the diverse shapes of cortical receptive fields. *J. Comp. Neurosci.* 22(2):135-146

9. Rehn, M., Sommer, F. T. (2006) Storing and restoring visual input with collaborative rank coding and associative memory *Neurocomputing* 69:1219-1223

10. Sommer, F. T., Kanerva, P. (2006) Can neural models of cognition benefit from the advantages of connectionism? *Behavioral and Brain Sciences* 29 (1):86-87

11. Sommer, F. T., Wennekers T. (2005) Synfire chains with conductance-based neurons: internal timing and coordination with timed input. *Neurocomputing* 65-66:449-454

12. George, D., Sommer, F. T. (2005) Computing with inter-spike inverval codes in networks of integrate and fire neurons. *Neurocomputing* 65-66:414-420

13. Martinez, J. M., Wang, Q., Reid, R. C., Pillai, C., Alonso, J.-M., Sommer F. T., Hirsch, J.A. (2005) Receptive field structure varies with layer in the primary visual cortex. *Nature Neuroscience* 8: 372 - 379

14. Knoblauch A., Sommer F. T. (2004) Spike-timing dependent plasticity can form "zero-lag" links for cortical oscillations. *Neurocomputing* 58-60:185-190

15. Glatting, G., Mottaghy, F. M., Karitzky, J., Baune, A., Sommer, F. T., Landwehrmeyer, G. B., Reske, S. N. (2004) Improving binding potential analysis in [11C]raclopide PET studies using cluster analysis. *Medical Physics* 31: 902-906

16. Hirsch, J.A., Martinez, J.M., Pillai, C., Alonso, J.-M., Wang, Q., Sommer F. T. (2003) Functionally distinct inhibitory neurons at the first stage of visual cortical processing. *Nature Neuroscience* 6 : 1300-1308

17. Knoblauch A., Sommer F. T. (2003) Synaptic plasticity, conduction delays and inter-areal phase relations of spike activity in a model of reciprocally connected areas. *Neurocomputing* 52-54:301-306

18. Sommer F. T., Wennekers T. (2003) Models of distributed associative memory networks in the brain *Theory in Biosciences* 122: 70-86

19. Knoblauch A., Wennekers T., Sommer F. T. (2002) Is voltage dependent synaptic transmission in NMDA receptors a robust mechanism for working memory? *Neurocomputing* 44-46:19-24

20. Sommer F. T., Wennekers T. (2001) Associative memory in networks of spiking neurons. *Neural Networks* 14: 825-834

21. Vollmer U., Sommer F. T. (2000) Coexistence of short and long term memory in a network of realistic neurons. *Neurocomputing* 38-40: 1031-1036

22. Sommer F. T., Wennekers T. (2000) Modeling studies on the computational function of fast temporal structure in cortical circuit activity. *Journal of Physiology, Paris* 94: 473-488

23. Sommer F. T., Wennekers T. (2000) Associative memory in a pair of cortical groups with reciprocal connections. *Neurocomputing* 38-40: 1575-1580

24. Sommer F. T. (2000) On cell assemblies in a cortical column. *Neurocomputing* 32-33: 517-522

25. Kötter R., Sommer F. T. (2000) Global relationship between anatomical connectivity and activity propagation in the cerebral cortex. *Philosophical Transactions of the Royal Society: Biological Sciences* 355: 127-134

26. Wennekers T., Sommer F. T. (1999) Gamma-oscillations support optimal retrieval in associative memories of Pinsky-Rinzel neurons. *Neurocomputing* 26-27: 573-578

27. Baune A., Sommer F. T., Erb M., Wildgruber D., Kardatzki B., Palm G., Grodd W. (1999) Dynamical cluster analysis of cortical fMRI activation. *NeuroImage* 6: 477-489

28. Sommer F. T., Palm G. (1999) Improved bidirectional retrieval of sparse patterns stored by Hebbian learning. *Neural Networks* 12: 281-297

29. Sommer F. T., Dayan P. (1998) Bayesian retrieval in associative memories with storage errors. *IEEE Trans. Neural Networks* 9: 705-713

30. Schwenker F., Sommer F. T., Palm G. (1996) Iterative retrieval of sparsely coded associative memory patterns. *Neural Networks* 9: 445-455

31. Palm G., Sommer F. T. (1992) Information capacity in recurrent McCulloch-Pitts networks with sparsely coded memory states. *Network* 3: 177-186

32. Frodl P., Sommer F. T., Hau K., Wahl F. (1990) On the effective interaction of two hydrogen centres in niobium. *Z. f. Naturforsch*. 43a: 857-866

33. Hau K., Frodl P., Gnirß M., Sommer F. T., Wahl F. (1989) A microscopic theory of a α-phase hydrogen in niobium. *Z. f. physikalische Chemie* 163: 549-554

34. Hau K., Frodl, P. Sommer F. T., Wahl F. (1988) A microscopic theory of a single hydrogen centre in niobium. *Z. f. Naturforsch*. 43a: 914-922

35. Sommer, F. T., Hau, K., Wahl F. (1988) Calculation of the excitation energies of a hydrogen impurity in niobium. *Z. f. Naturforsch*. 43a: 923-929

Book Chapters

1. Sommer F. T., Hirsch, J.A., Wichert A. (2003) Theories, data analysis, and simulation models in neuroimaging—An overview. *Exploratory analysis and data modeling in functional neuroimaging*, Eds. F. T. Sommer, A. Wichert, MIT Press, Cambridge, MA

2. Wichert A., Walter H., Grothe, J., Abler, B., Sommer F. T. (2003) Detection of task-related activity during working memory using event-related fMRI. *Exploratory analysis and data modeling in functional neuroimaging*, Eds. F. T. Sommer, A. Wichert, MIT Press, Cambridge, MA

3. Kötter R., Nielsen, P., Dyhrfjeld, J., Sommer, F.T., Northoff, G. (2002) Multi-level integration of quantitative neuroanatimical data. *Computational Neuroanatomy: Principles and Methods*. Ed.: G. Ascoli, Humana Press Inc., Totowa, NJ

4. Baune, A., Wichert, A., Glatting, G., Sommer, F.T. (2001) Dynamical cluster analysis for the detection of microglia activation. *Artificial Neural Nets and Genetic Algorithms*. Eds. V. Kurkova, N. C. Stelle, R. Neruda, M. Karny. Springer, Wien 442 - 445

5. Wichert A., Baune A. Grothe J., Grön G., Walter H., Sommer F. T. (2001a) Interpretation of event-related fMRI using cluster analysis. *Artificial Neural Nets and Genetic Algorithms*. Eds. V. Kurkova, N. C. Stelle, R. Neruda, M. Karny. Springer, Wien 446 - 448

6. Wichert, A., Kestler, H., Walter, H., Groen, G., Baune, A., Grothe, J., Wunderlich, A., Sommer, F.T. (2001b) Explorative detection of delay activity during a working memory task. *Proceedings 4th International Conference on Neural Networks and Expert Systems in Healthcare*. Ed. G. M. Papadourakis. Technological Educational Institute of Crete, Heraklion 266 - 271

7. Sommer F. T., Wennekers T., Palm G. (1998) Bidirectional completion of cell assemblies in the cortex. In *Computational Neuroscience: Trends in Research* 1998, Plenum Press, New York

8. Sommer F. T., Palm G. (1998) Bidirectional retrieval from associative memory. In *Advances in Neural Information Processing Systems* 10, MIT Press, Cambridge, MA, USA, pp. 675 - 681

9. Sommer F. T., Kötter R. (1997) Simulating a network of cortical areas using anatomical connection data in the cat. In *Computational Neuroscience: Trends in Research* 1997, Plenum Press, NewYork, pp. 511-517

10. Palm G., Schwenker F., Sommer F. T., Strey A. (1997) Neural associative memory. In *Associative Processing and Processors*, Eds. A. Krikelis, C. C. Weems. IEEE CS Press, Los Alamitos, CA, USA, pp. 307-326

11. Sommer F. T., Schwenker F., Palm G.(1995) Assoziative Speicher als Module in informationsverarbeitenden Systemen. In *Contributions to the workshop Aspekte Neuronalen Lernens*, Eds. L. Cromme, J. Wille, T. Kolb. TU Cottbus Press, 109-122

12. Wennekers T., Sommer, F. T., Palm G. (1995) Iterative retrieval in associative memories by threshold control of different neural models. In *Supercomputers in Brain Research: From Tomography to Neural Networks*, Eds. H. J. Herrmann, D. E. Wolff, E. Pöppel. World Scientific, Singapore, pp. 301-319

13. Palm G., Sommer F. T. (1995) Associative data storage and retrieval in neural nets. In *Models of Neural Networks III*, Eds. E. Domany, J. L. van Hemmen, K. Schulten. Springer, New York, pp. 79-118

14. Palm G., Sommer F. T. (1994) Associative memory and sparse similarity preserving codes. In *From Statistics to Neural Networks: Theory and Pattern Recognition Applications*, Ed. V. Cherkassky. Springer NATO ASI Series F, New York, pp. 282-302

15. Palm G., Sommer F. T. (1991) Information and pattern capacities in neural associative memories with feedback for sparse memory patterns. In *Neural Network Dynamics*, Eds. J. G. Taylor, E. R. Caianello, R. M. J. Cotterill, J. W. Clark. Springer, New York, pp. 3-18

Selected Abstracts

Coulter, W. K., Hillar, C. J., Sommer F. T. (2009) Adaptive compressed sensing - a new class of self-organizing coding models for neuroscience. CoSyNe Conference.

Monaci, G., Sommer F. T., Vandergheynst, G. (2008) Learning Sparse Generative Models of Audiovisual Signals, Proceedings of European Conf. on Signal Processing (EUSIPCO08).

Rehn M., Warland D.K., Sommer F.T. (2007) A minimal computational model that captures the shape diversity of V1 receptive fields. Soc. Neurosci. Abstr.

Wang X., Vaingankar V., Soto Sanchez C., Wie Y., Wang Q., Koepsell K., Sommer F.T., Hirsch J. (2007) Synaptic inputs to local interneurons in the lateral geniculate nucleus of the cat can be explained by feedforward mechanisms. Soc. Neurosci. Abstr.

Soto Sanchez C., Vaingankar V., Wang X., Sommer F.T., Hirsch J.A. (2007) Visual responses of cells in the perigeniculate nucleus of the thalamus in the cat. Soc. Neurosci. Abstr.

Koepsell, K., Vaingankar, V., Wang, X., Wei, Y., Wang, Q., Hirsch, J. A., Sommer F.T. (2006) Two channels for visual information tor travel from thalamus to cortex. Soc. Neurosci. Abstr.

Vaingankar V., Wie Y., Wang X., Koepsell K., Sommer F.T., & Hirsch J.A. (2006) Convergent retinal input to relay cells in the cat's thalamus. Soc. Neurosci. Abstr.

Martinez L.M., Wang Q., Sommer F.T., Hirsch J.A. (2006) Synaptic integration in the cat's lateral geniculate nucleus. Soc. Neurosci. Abstr.

Koepsell, K., Wei, Y., Wang, Q., Wang, X., Vaingankar, V., Hirsch, J. A., Sommer F.T. (2005) Ongoing retinal activity explains variability of thalamic responses. Soc. Neurosci. Abstr.

Wang, X., Wei, Y., Wang, Q., Vaingankar, V., Koepsell, K., Sommer F.T. Hirsch, J. A. (2005) Supression from the center of the thalamic receptive field preceeds bursts of action potentials evoked by natural movies. Soc. Neurosci. Abstr.

Koepsell K., Wei Y., Wang X., Wang Q., Hirsch J.A., Sommer F.T. (2005) Temporal precision and oscillations in the inputs and outputs of thalamic relay cells during natural stimulation. CoSyNe conference.

Rehn M., Sommer F.T. (2005) A network model for the rapid formation of binary sparse representations of sensory inputs CoSyNe conference.

Koepsell, K., Wei, Y., Wang, Q., Wang, X., Hirsch, J. A., Sommer F.T. (2004) Spike timing in thalamic relay cells during natural stimuli. Soc. Neurosci. Abstr.

Wang, X., Wang, Q., Wei, Y., Koepsell, K., Sommer F.T. Hirsch, J. A. (2004) Retinal and local constributions to the thalamic receptive field. Soc. Neurosci. Abstr.

Wichert, A., Walter, H., Groen, G., Baune, A., Grothe, J., Wunderlich, A., Sommer F.T. (2001) Interpretation of event-related fMRI using cluster analysis. Neuroimage (13) (2001) 282

Ruckgaber, J., Glatting, G., Karitzky, J., Baune, A., Sommer, F.T., Neumaier, B., Reske, S.N. (2001) Clusteranalyse in der Positronen-Emissions-Tomographie des Hirns mit C-11-PK11195. Nuklearmedizin (40) (2001) A95

Walter, H., Sommer, F.T. (2000) From localization to patterns of connectivity: Towards a global analysis of brain activity in functional neuroimaging studies. Assoc. for the Sci. Study of Conciousness.

Baune, A., Erb, M., Sommer, F.T., Wildgruber, D., Klose, U., Grodd, W. (1997) Evaluation of fast fMRI measurments in motorcortex: comparing a new cluster analysis with z-mapping. Experimental Brain Research, Vol. 117, Suppl. 50