

Curriculum Vitae Barbara Hammer

Personal information

Family name, first name: Hammer, Barbara
Research ID: E-8624-2010
Date of birth: 31.07.1970
URL: <http://www.techfak.uni-bielefeld.de/~bhammer/>

Education

- 2003: Habilitation in Computer Science at University of Osnabrück, Germany
Title: Mathematical aspects of neural networks, External reviewer: A. Sperduti, T. Martinetz
- 1999: PhD (with distinction) in Computer Science at University of Osnabrück, Germany
Title: Learning with recurrent neural networks,
Supervisor: V. Sperschneider, external reviewer: M. Vidyasagar
- 1995: Diploma (with distinction) in Mathematics at University of Osnabrück, Germany
Title: The Beilinson spectral sequence and applications (focus: pure mathematics)

Current position

since 2010: Professor for Machine Learning (formerly Theoretical Computer Science for Cognitive Systems), Bielefeld University, Germany

Previous positions

- 2004-2010: Professor (Theoretical Computer Science), Clausthal University of Technology, Germany
- 2000-2004: Group leader of the junior research group 'Learning with neural methods on structured data' funded within an innovation research program of the MWK Lower Saxony at Univ.Osnabrück
- 1995-2000: Research assistant in the group Theoretical Computer Science at University of Osnabrück

Awards

- Best paper awards at IEEE ICDM'16, WSOM'16, ESANN'15, WSOM'14, ESANN'14, ICPRAM'13, KI'07, ICANN'02
- Awards for exceptional performance as Master / PhD student (1994 / 1999) from University of Osnabrück

Supervision of graduate students and postdoctoral fellows

since 2010: 1 Habilitation, 6 PhD, 16 MSc, 1 Diploma, 14 BSc, Bielefeld University

2004-2010: 3 PhD, 20 Diploma, Clausthal University of Technology

2000-2004: 1 PhD, 4 MSc, 2 Diploma, 3 BSc, University of Osnabrück

Teaching activities

- 2015 invited course: Machine Learning at IK Günne
- 2014 tutorial: Prototype-based Methods: Mathematical Foundations, interpretability, and data visualization, IEEE WCCI
- 2007 invited course: Neuroinformatics at IK Günne
- 2007 invited doctorate course: Prototype based classification and clustering, Univ. Louvain la Neuve
- 2005 tutorial: Connectionist Knowledge Representation and Reasoning, KI'2005
- since 2010 at Bielefeld University: yearly lectures on Theoretical Computer Science, Advanced Algorithms, Machine Learning, Modern Data Analysis, Data and Web Mining, various seminars and projects

- 2004-2010 at Clausthal University of Technology: yearly lectures on Theoretical Computer Science, Algorithms and Data Structures, Bioinformatics, Modern Data Analysis, Neural Computation, Softcomputing, Data and Web Mining, various seminars and projects
- 2000-2004 at University of Osnabrück: yearly lectures on Neural Networks, Softcomputing
- I have been nominated for a best teaching award by students in Osnabrück in 2004, and I have twice received the teaching award 'silver chalk' from the student association of the Faculty of Technology at Bielefeld University

Organisation of scientific meetings

- Technical co-chair IEEE IJCNN 17
- Programm co-chair IEEE BigDataSE 15
- Co-chair of the symposia IEEE CIDM 14, IEEE CIDM 13
- Co-chair of the workshop NC² since 2010 (<http://www.techfak.uni-bielefeld.de/~bhammer/GINN/NC2/>)
- Co-organization of six Dagstuhl seminars (<http://www.dagstuhl.de/programm/dagstuhl-seminare/>) (with M.Biehl, L.de Raedt, S.Hochreiter, P.Hitzler, S.Kremer, W.Maass, E.Merenyi, A.Sperduti, M.Toussaint, M.Verleysen, T.Villmann)
- Co-organization of one MPI Physics of complex systems seminar (<http://www.mpipks-dresden.mpg.de/>) (with M.Biehl, W.Kinzel)
- Co-organization of a NIPS'2010 workshop on Challenges of Data Visualization (with L.van der Maaten, F.Sha, A.Smola)
- Co-organization of about 20 special sessions at international conferences
- I have been invited to co-organize the session in Mathematics/Computer Science of the German-Japanese Frontiers of Science Conferences in 2008 and 2009 (with T.Shibata, on invitation from JSPS/AvH foundation)

Institutional responsibilities

- Since 2017: Member of the Faculty Board
- Since 2017: Ombudsperson of the University for PhD researchers
- Since 2015: Member of the University Commission of Research
- Since 2015: Member of the University Commission for International Guest Researchers
- Since 2013: Vice-spokesperson Bielefeld-Vancouver Graduate School DiDy
- 2013-2015: Coordinator of the study curriculum Informatics in the Natural Sciences
- Since 2010: Erasmus coordinator Faculty of Technology, Bielefeld University
- External member / reviewer of more than 30 PhD committees (Germany, France, Finland, Belgium, The Netherlands, Switzerland, Spain, South Africa, Italy, ...)
- Member of more than 20 internal and external review boards for professorship applicants
- 2007-2010: Member of the Management Board Institute of Informatics, TU Clausthal
- 2007-2010: Coordinator for the diploma studies Computer Science , TU Clausthal

Commissions of trust

- Elected member of the IEEE CIS Administrative Committee in 2016-2018
- Chair of the IEEE CIS Distinguished Lecturers Program Committee in 2016 /2017
- Chair IEEE CIS Data Mining Technical Committee in 2013 and 2014
- Chair IEEE CIS DMTC Task Force on Data Visualisation and Data Analysis
- Chair Section Neural Networks of the German Computer Science Society
- Co-chair German Neural Networks Society
- Chair of the IEEE CIS Distinguished Lecturers Committee in 2016 and 2017
- Elected as Board Member of INNS in 2017

- Treasurer of ENNS
- Reviewer for national / international science organisations (e.g. DFG, NWO, FWO, AvH foundation, Finnish Academy of Sciences) and international conferences / journals
- Editorial board member Neural Networks, IEEE TNNLS, Neurocomputing, Neural Processing Letters, Cognitive Systems Research, Computational Intelligence Magazine (up to 2016)
- Guest editor for DAMI (with D.Keim, N.Lawrence, G.Lebanon), IEEE Computational Intelligence Magazine (with Yachou Yin), Neurocomputing (with M.Cottrell, T.Villmann), Logic Journal of the IGPL (with M.Gori, P.Hitzler, G.Palm), Neural Networks (with C.Saunders, A.Sperduti), KI (with M. Toussaint)
- Board member Dagstuhl open access series OASlcs

Memberships of scientific societies

Member IEEE CIS, GNNS, INNS, GI

Some recent major collaborations

- Michael Biehl, RU Groningen (NL), Biomedical Applications of LVQ Techniques
- Haibo He, Rhode Island (USA), Processing Big and Streaming Data
- Niels Pinkwart, HU Berlin (DE), Intelligent Tutoring Systems
- Alessandro Sperduti, Univ.Padova (IT), Learning with Structured Data
- Peter Tiño, Univ.Birmingham (UK), Recurrent Neural Networks
- Heiko Wersing, Honda R&D (DE), Incremental Learning Systems

Career breaks

2009 and 2006: maternity leave for 2 resp. 3 months

Track-record

B. Hammer has published more than 80 articles in peer-reviewed journals, more than 150 articles in peer-reviewed international conferences, 10 book articles, and 4 books. Her h-index is 20 (web of science), resp. 36 (google scholar). She has received more than 50 invitations to present her work (more than 10 of which as plenary speaker to international conferences), and she has been invited as guest researcher to University Paris I (by Marie Cottrell), Universities of Pisa and Padova (by Alessandro Sperduti), CAIR Bangalore (by Mathukumalli Vidyasagar), and University of Birmingham (by Peter Tino), among others.

Selected publications in international journals (with peer review)

- Frank-Michael Schleif, Barbara Hammer, Javier Gonzalez Monroy, Javier González Jiménez, José-Luis Blanco-Claraco, Michael Biehl, Nicolai Petkov: Odor recognition in robotics applications by discriminative time-series modeling. *Pattern Anal. Appl.* 19(1): 207-220 (2016)
- Frank-Michael Schleif, Xibin Zhu, Barbara Hammer: Sparse conformal prediction for dissimilarity data. *Ann. Math. Artif. Intell.* 74(1-2): 95-116 (2015)
- Sebastian Gross, Bassam Mokbel, Benjamin Paaßen, Barbara Hammer, Niels Pinkwart: Example-based feedback provision using structured solution spaces. *International Journal of Learning Technology* 9(3): 248-280 (2014)
- Bassam Mokbel, Wouter Lueks, Andrej Gisbrecht, Barbara Hammer: Visualizing the quality of dimensionality reduction. *Neurocomputing* 112: 109-123 (2013)
- Kerstin Bunte, Michael Biehl, Barbara Hammer: A General Framework for Dimensionality-Reducing Data Visualisation Mapping. *Neural Computation* 24(3): 771-804 (2012).
- Frank-Michael Schleif, Thomas Villmann, Barbara Hammer, Petra Schneider: Efficient Kernelized Prototype Based Classification. *Int. J. Neural Syst.* 21(6): 443-457 (2011).

- Petra Schneider, Kerstin Bunte, Han Stiekema, Barbara Hammer, Thomas Villmann, Michael Biehl: Regularization in matrix relevance learning. *IEEE TNN* 21(5): 831-840 (2010).
 - Petra Schneider, Michael Biehl, Barbara Hammer: Adaptive Relevance Matrices in Learning Vector Quantization. *Neural Computation* 21(12): 3532-3561 (2009)
 - Thomas Villmann, Frank-Michael Schleif, Markus Kostrzewa, Axel Walch, Barbara Hammer: Classification of mass-spectrometric data in clinical proteomics using learning vector quantization methods. *Briefings in Bioinformatics* 9(2): 129-143 (2008)
 - Michael Biehl, Anarta Ghosh, Barbara Hammer: Dynamics and Generalization Ability of LVQ Algorithms. *Journal of Machine Learning Research* 8: 323-360 (2007)
- (see e.g. <http://www.informatik.uni-trier.de/~ley/pers/hd/h/Hammer:Barbara> for a more complete list)

Invited presentations at international conferences / workshops

- Transfer learning and learning with Concept Drift, *Statistical Computing* 2017
- Structure metric learning for intelligent tutoring systems, *Workshop Cognitive Computing at NIPS2016*
- Discriminative dimensionality reduction for data inspection and classifier visualization, *AIAI* 2016
- Structure metric learning in prototype-based models and its application to intelligent tutoring, *IEEE CIDM* 15
- Structure metric learning learning for prototype-based models, *SIMBAD* 2015
- Autonomous model selection for prototype based architectures, *Engineering Applications of Neural Networks* 2015
- Metric Learning and Model Interpretability, *International Conference on Artificial Neural Networks*, 2014
- Nonlinear dimensionality reduction and its applications for data visualization, *IAS Workshop on Data analysis, machine learning, and modelling in the bio-medical domain*, Univ. Birmingham, 2014
- Advances in dimensionality reduction, *MPI Physics of Complex Systems, Workshop on Statistical Inference: Models in Physics and Learning*, 2012
- How to visualize large data sets?, *International Workshop on Self-Organizing Maps*, 2012
- Recent Developments in Prototype-based Learning, *CSIRO ICT Workshop on distributed machine learning and sparse representation with massive data sets*, 2011
- Topographic mapping of dissimilarity data, *International Workshop on Self-Organizing Maps*, 2011
- Clustering very large dissimilarity data sets, *International Workshop on Artificial Neural Networks in Pattern Recognition*, 2010
- Machine learning using prototype-based methods, *Japanese-German Frontiers of Science Conference*, 2006
- Self-organizing maps for time series, *International Workshop on Self-Organizing Maps*, 2005

Recent projects funded by third parties

- Cooperative Interaction Mental Models for Assistive Systems (Honda R & D Project)
- Discriminative Dimensionality Reduction (DFG Sachbeihilfe)
- Learning Dynamic Feedback in Intelligent Tutoring Systems (DFG Sachbeihilfe, SPP Autonomous Learning)
- Online Learning with Exemplar-based Architectures in Adaptive Metrical Spaces (Honda R & D Project)
- Context-based online learning for personalized assistance functions (Honda R & D Project)
- PI in the cluster of excellence Cognitive Interaction Technologies – CITEC (Exzellenzinitiative des Bundes)
- PI in the international graduate school Diversity and Dynamics of Genomes (DFG)
- PI in the leading edge cluster Intelligent Technical Systems in OWL (BMBF)