Felix Bießmann

Curriculum Vitae

Education

Sep 2008 – Nov 2011 **Doctor of Philosophy (Dr. rer. nat.)**, *Machine Learning*, Berlin Institute of Technology (TU Berlin) / Bernstein Center for Computational Neuroscience.
Summa cum laude

Sep 2005 – Aug 2007 **Master of Science**, *Neuroscience*, Eberhard-Karls University / International Max-Planck Research School, Tübingen.

Sep 2002 – Aug 2005 **Bachelor of Science**, *Cognitive Science*, University of Osnabrück.
With distinction

Doctoral Thesis

Title *Data-driven Analysis for Multimodal Neuroimaging Data*

Supervisors Prof. Dr. Klaus-Robert Müller & Prof. Dr. Nikos Logothetis

Description We used kernel methods to integrate multimodal non-linearly and non-instantaneously coupled data streams for investigating spatiotemporal dynamics of neurovascular coupling mechanisms. Originally developed for neuroscience data, we also applied these algorithms to large scale web data.

Masters Thesis (Sep 2006 – Aug 2007)

Title *Error-Correcting Codes for the P300 Visual Speller*

Supervisors Prof. Dr. Bernhard Schölkopf & Dr. N. Jeremy Hill

Description We used error-correcting codes in order to improve the information transfer rate in a classical brain-computer interface paradigm that can be used to typewrite using mental activity.

Bachelor Thesis (Sep 2004 – Aug 2005)

Title *Biophysical Characterization of V1 Neurons*

Supervisors Prof. Dr. Peter König & Dr. Ora Ohana

Description We used clustering methods to identify classes of visual neurons that share morphological and biophysical properties.

Work Experience

Starting October 2018 — **Einstein Professor for Data Science (Tenured W2 Professorship)**, *Beuth University of Applied Sciences*.

Since October 2017 — **Senior Machine Learning Scientist**, Amazon Research, Berlin.

- End-to-end development of scalable machine learning infrastructure and applications. Leading research scientist for a project on cleaning product catalog data, which involves software design, implementation, deployment and maintenance of a large scale machine learning system for imputing missing values of product attributes in Amazon's catalog.
- Development of Machine Learning program for students in collaboration with BITKOM
- Representation of Amazon Research at internationally recognized research institutions
- Supervision and mentoring of graduate student interns

January 2014 – September 2017 — **Machine Learning Scientist**, Amazon Research, Berlin.

- Design, implementation and evaluation of prototypes and production ready systems for fashion and arts recommender systems.
- Development of computer vision systems using classical computer vision features and convolutional neural networks for prediction of product attributes.

April 2013 – April 2014 — **Assistant Professor**, Dept. Brain and Cognitive Engineering, Korea University, Seoul.

- Teaching graduate student level machine learning classes and seminars.
- Supervision of Master and PhD students.
- Development of novel hardware setups, software solutions and algorithms for novel prosthetic devices controlled with mental activity.
- Leading and conducting brain research projects on visual cognition based on human fMRI and EEG recordings.

May 2011– February 2013 — **Postdoc**, Dept. Machine Learning, TU Berlin.

Development of machine learning methods for large scale web and text data mining, neuroscientific research and biomedical applications.

- Teaching machine learning classes and seminars.
- Project lead BMBF Project ALICE (01IB10003B)
- Coordinating collaborations with research labs and industry partners
- Acquiring new funding
- Supervising students (BSc, MSc theses and PhD students)

Feb 2011 – April 2011 — **Research Assistant**, Visual Cognition Lab, Université de Fribourg.

Data acquisition for PhD project: Hard– and Software development for iontophoretic and visual stimulation of primary visual cortex in tupaia belangari. Design and implementation of Analysis Software.

Sep 2007– Sep 2008 — **Research Assistant**, *Dept. Physiology of Cognitive Processes*, MPI Biological Cybernetics, Tübingen.

Software development for simultaneous realtime acquisition online artifact removal of intracranial electrophysiology signals and functional magnetic resonance imaging data.

Sep 2006 – Sep 2007 — **Research Assistant**, *Dept. Empirical Inference*, MPI Biological Cybernetics, Tübingen.

Software development for realtime acquisition of electro-encephalographic (EEG) signals for brain-computer interfaces.

Sep 2004 – April 2005 — **Research Assistant**, Institute of Cognitive Science, Dept. Computational Linguistics, Osnabrück.

Import and part-of-speech annotation of large text corpora.

Selected Teaching Activity

- Lecture *Python for Data Science*
- Seminar *Urban Technologies*
- Seminar *New Developments in Machine Learning*
- Seminar *Scientific Writing*
- Seminar *Advanced Topics in Machine Learning*
- *Introduction to Machine Learning*, Graduate Level Course, Lecture and Practice
- *Cognitive Algorithms*, Undergrad Level Course, Lecture and Practice
- Seminar *Applications of Cognitive Algorithms*, Graduate Level Course
- Seminar *Hot Topics in Machine Learning*, Graduate Level Course
- Seminar *Classical Topics in Machine Learning*

Selected Reviewing Activity

- Neuroimage
- Advances in Neural Information Processing Systems (NIPS)
- International Conference for Machine Learning (ICML)
- International Conference on Artificial Intelligence and Statistics (AISTATS)
- Very Large Databases (VLDB)
- European Conference on Information Systems (ECIS)
- IEEE Transactions on Biomedical Engineering
- International Joint Conference on Artificial Intelligence
- Cognitive Computation
- Neurocomputing
- Medical & Biological Engineering & Computing

Selected Invited Talks

2018 **Alan Turing Institute, London**, *Data Preparation Challenges in Machine Learning Production Systems*.

Berlin Social Science Center, *The Manifesto Corpus Conference*, Speeding up the Manifesto Project: Active learning strategies for efficient automated political annotations.

2017 **SciCar Conference**, *Die Wahlprogramme in der Machine-Learning Analyse*.

Zuendfunk Netzkongress, *Rechts, links, oder? Ein Algorithmus kennt die Antwort. Wahlprogramm Analysen zum Bundestagswahlkampf 2017*.

2016 **International Conference on the Advances in Computational Analysis of Political Text (POLTEXT), Dubrovnik**, Predicting Political Party Affiliation from Text.

PyData Berlin, *Predicting political views from text*.

2014 **GIPSA Laboratory, Grenoble**, *Workshop on challenges in multimodality*, Linear and Non-linear subspace methods for multimodal neuroimaging.

Human Brain Mapping Conference, *Kernel Methods for Multimodal Neuroimaging Data*, Hamburg.

2012 **Hanse Wissenschaftskolleg, Delmenhorst**, *Optimal searchlight decoding for intracranial neural signals from fMRI*.

Machine Learning Lab, Albert-Ludwigs University Freiburg, *Non-linear vs. linear methods in neuroscientific and biomedical applications*.

2011 **Dept. Physiology of Cognitive Processes, MPI Biological Cybernetics, Tübingen**, *Spatiotemporal decoding of neural signals from fMRI*.

2010 **Redwood Center for Theoretical Neuroscience, UC Berkeley**, *CCA based methods for data with non-instantaneous couplings*.

Vision Lab of Brian Wandell, Stanford University, *Spatiotemporal dynamics of neurovascular coupling*.

Patents

2018 **US Patent 9892133**, *Biessmann, Archambeau, Dorner, Gyllstrom, Haitani, Martin*, *Verifying Item Attributes Using Artificial Intelligence*.

Journalism

2017 ***Der Computer sagt: Jamaika*, Analysen zur Bundestagswahl 2017**.

Community Service

2017 **Datascience for Social Good Initiative**, *Participation in data-dive*.

2016 **Datascience for Social Good Initiative**, *Participation in data-dive*.

2014-now **OpenKnowledge Lab Berlin**, *Data-Science for political education*.

Peer-Reviewed Publications

Sebastian Schelter, **Felix Bießmann**, Tim Januschowski, David Salinas, Stephan Seufert and Gyuri Szarvas On Challenges in Machine Learning Model Management Bulletin of the IEEE Computer Society Technical Committee on Data Engineering, 2019

Philipp Schmidt and **Felix Bießmann** Quantifying Interpretability and Trust in Machine Learning Systems To appear in: AAAI Workshop on Network Interpretability for Deep Learning, 2019

Stefan Grafberger, Philipp Schmidt, Tammo Rukat Mario Kiessling, Andrey Taptunov, **Felix Bießmann**, Dustin Lange Deequ - Data Quality Validation for Machine Learning Pipelines *ML Systems Workshop, NeurIPS 2018*

Felix Bießmann, David Salinas, Sebastian Schelter, Philipp Schmidt, Dustin Lange Deep Learning for Missing-Value Imputation in Tables with Non-Numerical Data International Conference on Information and Knowledge Management (CIKM), 2018

Sebastian Schelter, Dustin Lange, Philipp Schmidt, Meltem Celikel, **Felix Bießmann**,

Andreas Grafberger Automating Large-Scale Data Quality Verification *Very Large Databases (VLDB), 2018*

Felix Bießmann, Philipp Schmidt Speeding up the Manifesto Project: Active learning strategies for efficient automated political annotations, *Manifesto Project Conference, Social Science Center Berlin, 2018*

Emanuel Neto, **Felix Bießmann**, Harald Aurlien, Helge Nordby, Tom Eichele. Regularized linear discriminant analysis of EEG features in dementia patients. *Frontiers in Aging Neuroscience, 2016*

Sebastian Schelter, **Felix Bießmann**, Malisa Zobel, Nedelina Teneva. Structural Patterns in the Rise of Germany's New Right on Facebook *IEEE 16th International Conference on Data Mining Workshops (ICDMW), 2016*

Felix Bießmann, Pola Lehmann, Daniel Kirsch and Sebastian Schelter. Predicting Political Party Affiliation from Text Data. *International Conference on the Advances in Computational Analysis of Political Text, 2016*

Sven Daehne, **Felix Bießmann**, Wojciech Samek, Stefan Haufe, Dominique Goltz, Christoph Gundlach, Arno Villringer, Siamac Fazli, and Klaus-Robert Müller. Multivariate Machine Learning Methods for Fusing Multimodal Functional Neuroimaging Data *Proceedings of the IEEE, 2015*

Siamac Fazli, Sven Daehne, Wojciech Samek, **Felix Bießmann** and Klaus-Robert Müller. Learning From More Than One Data Source: Data Fusion Techniques for Sensorimotor Rhythm-Based Brain-Computer Interfaces *Proceedings of the IEEE, 2015*

Jeong-Hun Kim, **Felix Bießmann**, Seong-Whan Lee. Decoding Three-Dimensional Trajectory of Executed and Imagined Arm Movements From Electroencephalogram Signals. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 2015

Achim Leydecker, **Felix Bießmann**, Siamac Fazli. Single-trials ERPs predict correct answers to intelligence test questions. *Pattern Recognition in Neuroimaging*, 2014

Michael Gaebler*, **Felix Bießmann*** (*equal contribution), Jan-Peter Lamke, Klaus-Robert Müller, Henrik Walter, Stefan Hetzer. Stereoscopic depth increases intersubject correlations of brain networks. *Neuroimage*, 2014

Stefan Haufe, Frank C. Meinecke, Kai Görgen, Sven Dähne, John-Dylan Haynes, Benjamin Blankertz, **Felix Bießmann** . On the interpretation of weight vectors of linear models in multivariate neuroimaging. *Neuroimage*, 2014

Sven Dähne, **Felix Bießmann**, Frank C. Meinecke, Jan Mehnert, Siamac Fazli, Klaus-Robert Müller Integration of Multivariate Data Streams with Bandpower Signals. *IEEE Transactions on Multimedia, Special Issue on Multimodal Biomedical Imaging.*, 2013

Felix Bießmann, Yusuke Murayama, Nikos K Logothetis, Klaus-Robert Müller, and Frank C Meinecke. Improved decoding of neural activity from fmri signals using non-separable spatiotemporal deconvolutions. *Neuroimage*, 61(4):1031–1042, 2012.

Felix Bießmann, Jens-Michalis Papaioannou, Mikio Braun, and Andreas Harth. Canonical trends: Detecting trend setters in web data. In Proceedings of *International Conference for Machine Learning*, 2012.

Anwesha Bhattacharyya, **Felix Bießmann**, Julia Veit, Robert Kretz, and Gregor Rainer. Functional and laminar dissociations between muscarinic and nicotinic cholinergic neuromodulation in the tree shrew primary visual cortex. *European Journal of Neuroscience*, 35(8):1270–80, 2012.

Felix Bießmann, Jens-Michalis Papaioannou, Andreas Harth, Matthias L. Jugel, Klaus-Robert Müller, and Mikio Braun. Quantifying spatiotemporal dynamics of twitter replies to news feeds. In *Proceedings of the IEEE International Workshop on Machine Learning for Signal Processing*, 2012.

Felix Bießmann, Frank C. Meinecke, Matthias L. Jugel, Mikio Braun. Online CCA for Realtime Impact Analysis of Social Media Data in *NIPS Workshop on Algorithmic and Statistical Approaches for Large Social Networks*, 2012.

J. M. Hahne, Hubertus Rehbaum, **Felix Biessmann**, Frank C. Meinecke, K.-R. Müller, N. Jiang, D. Farina, and Lucas C. Parra. Simultaneous and proportional control of 2d wrist movements with myoelectric signals. In *Proceedings of the IEEE International Workshop on Machine Learning for Signal Processing*, 2012.

Felix Bießmann and A Harth. Analysing dependency dynamics in web data. In *Proceedings of AAAI Spring Symposium, Stanford*, Jan 2010.

Felix Bießmann, Sergey M Plis, Frank C Meinecke, Tom Eichele, and Klaus-Robert Müller. Analysis of multimodal neuroimaging data. *Biomedical Engineering, IEEE Reviews in*, 4:26 – 58, 2011.

Felix Bießmann, Frank C Meinecke, Arthur Gretton, Alexander Rauch, Gregor Rainer, Nikos K Logothetis, and Klaus-Robert Müller. Temporal kernel cca and its application in multimodal neuronal data analysis. *Machine Learning Journal*, 79(1-2):5—27, 2010.

Yusuke Murayama, **Felix Bießmann**, Frank C Meinecke, Klaus-Robert Müller, Mark A Augath, Axel Oeltermann, and Nikos K Logothetis. Relationship between neural and hemodynamic signals during spontaneous activity studied with temporal kernel cca. *Magnetic Resonance Imaging*, 28(8):1095–1103, Jan 2010.

N. Jeremy Hill, Jason Farquhar, Suzanne Martens, **Felix Bießmann**, Bernhard Schölkopf. Effects of Stimulus Type and of Error-Correcting Code Design on BCI Speller Performance. In *Proceedings of NIPS*, 2008.

Other Publications

Felix Bießmann. Automating Political Bias Prediction. arXiv preprint `http://arxiv.org/pdf/1608.02195`

Nicolas Steenbergen, Sebastian Schelter, **Felix Bießmann**. Doubly stochastic large scale kernel learning with the empirical kernel map. arXiv preprint `http://arxiv.org/abs/1609.00585`

Book Chapters

Felix Bießmann, Frank C Meinecke, and Klaus-Robert Müller. *Introduction To Neural Engineering For Motor Rehabilitation*, chapter Unsupervised Decomposition Methods for Analysis of multi-modal Neural Data. Wiley, 2013.

Alexander Binder, Frank C Meinecke, **Felix Bießmann**, and Klaus-Robert Müller. *Grundlagen der praktischen Information und Dokumentation, 6. Ausgabe*, chapter Maschinelles Lernen und Mustererkennung in der Bildverarbeitung. de Gruyter, 2013.