Franziska Horn

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experience

04/2015 – present **Research Assistant** TU Berlin (Technische Universität Berlin)
- in the machine learning group of Prof. Dr. Klaus-Robert Müller
- developed the Similarity Encoder (SimEc) neural network architecture for learning low dimensional embeddings of data points by preserving similarity structures found in the original high dimensional input data; with applications e.g. in the area of NLP by extending the word2vec algorithm to produce embeddings for out-of-vocabulary words and words with multiple meanings
- supervised bachelor and master students
- funded by the Elsa-Neumann Scholarship from the state of Berlin

07/2016 – 06/2017 **Machine Learning Scientist** spectrm
- developed a chatbot AI to respond to user messages automatically
- implemented a content recommendation API for newspaper articles, which can be used by all clients to promote their content
- selected new members for the machine learning team

02/2014 – 06/2016 **Data Scientist** idalab
- advanced analytics consulting projects, algorithm development, presentation of results, and project management
- clients included razorfish (NLP backend for automatic content classification) and outfittery (style prediction algorithms for curated shopping)

09/2013 – 09/2014 **Student Research Assistant** TU Berlin
- machine learning research in the group of Prof. Dr. Klaus-Robert Müller
- focus on text classification, unsupervised learning (word2vec vector space embedding, dimensionality reduction), and information extraction
- short-term research stay at UCLA; collaboration with Prof. Dr. Alcino Silva

08/2012 – 08/2013 **Student Research Assistant** TU Berlin
- EEG data analysis at the Berlin Brain-Computer Interface Lab
- developed and efficiently implemented new algorithms in MatLab
- three peer-reviewed publications (journal and conferences)

07/2011 – 10/2011 **Research Intern** Massachusetts Institute of Technology (MIT)
- at the McGovern Institute for Brain Research / Gabrieli Lab
- analyzed fMRI data using NIPY with results published in JAMA Psychiatry
- sponsored by a DAAD RISE scholarship

07/2007 – 12/2009 **Student Research Assistant** Fraunhofer Institute for Chemical Technology
- hands-on science in the field of chemical analysis / infrared spectroscopy
- devised creative solutions for tricky experimental setups
- worked independently with the sole responsibility for the collection of data

education

04/2013 – 03/2015 **M.Sc. Computer Science** TU Berlin (Technische Universität Berlin)
- focus: intelligent systems. machine learning: theory, lab course, project; advanced information management (big data & Hadoop); neurobiology
- thesis: Knowledge Extraction from Complex Biological Texts: A Machine Learning Approach (supervisor: Prof. Dr. Klaus-Robert Müller, TU Berlin)
- graduated top of my class (1.0)

10/2012 – 03/2013 **M.Sc. Computational Neuroscience** BCCN / TU Berlin

- interdisciplinary & strongly research oriented international master program
- highly competitive application process (10 places/year)
- switched to computer science after 1 semester to deepen my technical knowledge and get a wider choice of application areas

10/2009 – 09/2012 **B.Sc. Cognitive Science** Universität Osnabrück

- interdisciplinary study program including courses in neurobiology, computer science, psychology, artificial intelligence, mathematics, computational linguistics, neuroinformatics, and philosophy; taught in English
- thesis in the field of brain-computer interfaces at the TU Berlin: Comparing and Combining Multiple EEG Features in Motor Imagery BCI – A Large Scale Study (supervisor: Prof. Dr. Benjamin Blankertz, TU Berlin)
- graduated with distinction (1.1)

09/2000 – 06/2009 **Abitur (secondary school)** Fichte-Gymnasium Karlsruhe

- 11th grade as a year abroad in Missouri (USA)

activities

October 2015 **Data2Day Workshop in Karlsruhe, Germany: Introduction to Data Science**

- 1 day workshop where I was responsible for the practical part and instructed the 25 participants on how to use Python, numpy, pandas, and sklearn to get the most out of their data

September 2014 **Advanced Scientific Programming in Python – Summer School in Split, Croatia**

- lectures and tutorials on advanced topics like parallelization and Cython
- programming project in teams: artificial intelligence for a pacman game

July 2012 **McKinsey Technology Lab "Big Data" in Prague**

- 4 day workshop to discuss the importance and usability of big data technology in various business areas, including a case study developing the concept for a big data application

regularly **various Meetups in Berlin**

- e.g. PyData and Machine Learning Talks

skills

language native German, fluent English, basic French

programming Python (main), SQL, MatLab, R, Java ~ https://github.com/cod3licious

computing Linux/Unix
office applications & LaTeX
Adobe Photoshop, InDesign, Illustrator

publications

Learning Similarty Preserving Representations with Neural Similarity Encoders
Franziska Horn and Klaus-Robert Müller
arXiv preprint arXiv:1702.01824, 2017.

Context encoders as a simple but powerful extension of word2vec
Franziska Horn
Proceedings of the 2nd Workshop on Representation Learning for NLP, 2017.

Interactive Exploration and Discovery of Scientific Publications with PubVis
Franziska Horn
arXiv preprint arXiv:1706.08094, 2017.

"What is Relevant in a Text Document?": An Interpretable Machine Learning Approach
Leila Arras, Franziska Horn, Gregoire Montavon, Klaus-Robert Müller and Wojciech Samek
PloS one, 12(8):e0181142, 2017.

Discovering topics in text datasets by visualizing relevant words
Franziska Horn, Leila Arras, Gregoire Montavon, Klaus-Robert Müller and Wojciech Samek
arXiv preprint arXiv:1707.06100, 2017.

Exploring text datasets by visualizing relevant words
Franziska Horn, Leila Arras, Gregoire Montavon, Klaus-Robert Müller and Wojciech Samek
arXiv preprint arXiv:1707.05261, 2017.

Explaining Predictions of Non-Linear Classifiers in NLP
Leila Arras, Franziska Horn, Gregoire Montavon, Klaus-Robert Müller and Wojciech Samek
Proceedings of the 1st Workshop on Representation Learning for NLP, 2016.

Robust Artifactual Independent Component Classification for BCI Practitioners
I. Winkler, S. Brandl, F. Horn, E. Waldburger, C. Allefeld, M. Tangermann
Journal of Neural Engineering, 11(3):035013, 2014.

Predicting Treatment Response in Social Anxiety Disorder From Functional Magnetic Resonance Imaging
O. Doehrmann, S. S. Ghosh, F. E. Polli, G. O. Reynolds, F. Horn, A. Keshavan, ... & J. D. Gabrieli
JAMA Psychiatry, 70(1):87-97, 2013.

Increasing the Spectral Signal-To-Noise Ratio of Common Spatial Patterns
Franziska Horn, Sven Dähne
Proceedings of the Fifth International Brain-Computer Interface Meeting, 2013.

Combining Multiple EEG Features in Motor Imagery BCI
Franziska Horn, Johannes Höhne, Sven Dähne, Benjamin Blankertz
BBCI Workshop - Advances in Neurotechnology, Berlin, Germany, 2012.