Franziska Horn

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experience

10/2018 – present **Freelance Data Science Consultant** Leipzig
- design, implementation, and evaluation of data science solutions tailored to the client's needs
- workshops on how to use machine learning techniques in practice
- clients include BASF and TRUMPF

03/2018 – 10/2018 **Data Science Consultant (Working Student)** BASF, Ludwigshafen
- most experienced Python developer in the team, responsible for code review
- implementation of machine learning algorithms, e.g., a library for automatic feature engineering and selection, and analysis of complex datasets to optimize processes in chemical plants

09/2017 – 02/2018 **Research Assistant** TU Berlin (Technische Universität Berlin)
- in the machine learning group of Prof. Dr. Klaus-Robert Müller
- predictive maintenance / time series analysis project in collaboration with BASF (worked on-site in Ludwigshafen)
- designed, implemented, and evaluated linear and non-linear regression models in Python to predict the degradation of catalysts in chemical plants

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

02/2014 – 06/2016 **Data Scientist** idalab, Berlin
- advanced analytics consulting projects, ML algorithm development in Python, 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** MIT (Massachusetts Institute of Technology), Cambridge, MA
- 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, Pfinztal
- worked independently, responsible for collection of infrared spectroscopy data

education

04/2015 – 03/2020 **Ph.D. Computer Science** TU Berlin (Technische Universität Berlin)

- in the machine learning group of Prof. Dr. Klaus-Robert Müller
- Similarity Encoder - A Neural Network Architecture for Learning Similarity Preserving Embeddings: developed a novel NN architecture to map high dimensional data into a low dimensional embedding space, where arbitrary pairwise relations between the data points are preserved as the embedding vectors factorize a given target similarity matrix; potential application areas include recommender systems, especially to target the cold start problem, i.e., generate recommendations for items without previous user ratings, and natural language processing, 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 universities of Berlin

04/2013 – 03/2015 **M.Sc. Computer Science** TU 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)

skills

language	German (native), English (fluent), French (basics)
programming	Python (9+ years), SQL, MatLab, R, Java ~ https://github.com/cod3licious
computing	Linux/Unix version control (git) office applications & LaTeX

publications

Forecasting Industrial Aging Processes with Machine Learning Methods
Mihail Bogojeski, Simeon Sauer, Franziska Horn, Klaus-Robert Müller
[Under review at the AIChE Journal], 2020.

The autofeat Python Library for Automatic Feature Engineering and Selection
Franziska Horn, Robert Pack, Michael Rieger
ECML PKDD Workshops 2019, Springer, Cham, 2020.

Automating the search for a patent's prior art with a full text similarity search
Lea Helmers*, Franziska Horn*, Franziska Biegler, Tim Oppermann, Klaus-Robert Müller
PLoS ONE, 14(3):e0212103, 2019.

Predicting Pairwise Relations with Neural Similarity Encoders
Franziska Horn and Klaus-Robert Müller
Bulletin of the Polish Academy of Sciences: Technical Sciences, 66(6):821-830, 2018.

Context encoders as a simple but powerful extension of word2vec
Franziska Horn
In *Proceedings of the 2nd Workshop on Representation Learning for NLP*, pages 10-14, Vancouver, Canada, August 2017. Association for Computational Linguistics.

"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.

Explaining Predictions of Non-Linear Classifiers in NLP
Leila Arras, Franziska Horn, Gregoire Montavon, Klaus-Robert Müller and Wojciech Samek
In *Proceedings of the 1st Workshop on Representation Learning for NLP*, pages 1-7, Berlin, Germany, August 2016. Association for Computational Linguistics.

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.

preprints

The DALPHI annotation framework & how its pre-annotations can improve annotator efficiency
Robert Greinacher and Franziska Horn
arXiv preprint arXiv:1808.05558, 2018.

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.

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