Dr. Franziska Horn

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An intellectually curious problem-solver with **12+ years of experience** across diverse industries, translating complex business problems into well-architected software & AI solutions, **creating clarity from concept to code**.

WORK EXPERIENCE

Freelance AI & Software Design Consultant | Leipzig (Germany) / remote 01/2026 - present
- helping teams in complex domains design clean, maintainable software architectures and integrate ML where it genuinely adds value
- conducting system audits and driving refactorings to reduce accidental complexity in existing codebases
- coaching development teams on domain-driven software design and effective use of AI-assisted coding practices

Fractional Tech Lead (Freelance) | alcemy, Berlin (remote) 03/2025 - 12/2025
- supported the cement data team by driving larger refactorings and building tools to improve internal processes

Sabbatical | Leipzig (Germany) 12/2023 - 02/2025
- wrote a book (published on Leanpub), worked on personal projects & learned new skills (Vue.js, Kotlin incl. Compose Multiplatform)
- joined the Carbon13 Venture Builder Program (Berlin Cohort 3) with the intention of founding a climate tech startup (Sept-Nov '24)

Head of Data & Solutions Engineering | alcemy, Berlin (remote) 10/2022 - 11/2023
- hired and led a team of three data scientists and engineers, responsible for customer integration and data-related customer requests
- created team vision & strategy and prioritized projects & objectives together with the customer success, product, and sales teams
- analyzed, documented, and optimized internal processes, e.g., reduced onboarding time for new customers from 50 to 25 days
- joined pre-sales discovery calls to surface integration requirements and translate product capabilities for non-technical audiences
- designed & built web apps empowering the customer success team to conduct recurring customer data analyses independently

Senior Customer-Facing Data Scientist | alcemy, Berlin (remote) 02/2022 - 10/2022
- analyzed laboratory data from our customers (cement plants), e.g., to identify irregularities in their production processes
- reduced time spent on recurring analyses by implementing configurable, reusable report templates
- simplified data integration process for new customers by planning and implementing refactorings of core product components, minimized required code files per customer to 6 from 17

Freelance Data Science Solutions Architect | Leipzig (Germany) / remote 10/2018 - 01/2022
- strategy & ideation workshops with department heads and product managers to identify potential AI use cases
- design, implementation, and evaluation of data science solutions tailored to my client's needs (using Python)
- 1:1 coaching sessions and multi-day trainings on how (and when) to use machine learning techniques in practice
- clients included BASF (consulting + coaching for ~2 years) and TRUMPF (regular trainings since 2019)

Postdoc Visiting Scientist | ML Group, TU Berlin (remote) 05/2020 - 11/2020
- developed continuously evolving word embeddings that account for meaning changes over time (published at ACL 2021)

Data Science Consultant | BASF, Ludwigshafen 09/2017 - 10/2018
- predictive maintenance project in collaboration with TU Berlin: designed, implemented, and evaluated time series analysis models to predict the degradation of catalysts in chemical plants (patented and published in Computers and Chemical Engineering)
- authored the open source Python library autofeat for automated feature engineering and selection with 500+ stars on GitHub

Machine Learning Team Lead | Spectrm, Berlin 07/2016 - 06/2017
- established the machine learning team and hired two ML engineers
- implemented a content recommendation API for newspaper articles to promote our clients' content (Python Flask App)
- developed a chatbot "AI" to respond to user messages automatically (using RiveScript)

Data Scientist | idalab, Berlin 02/2014 - 06/2016
- 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 for curated shopping)

Student Research Assistant | ML Group, TU Berlin 08/2012 - 09/2014
- research on text classification, unsupervised learning (word2vec embeddings, dimensionality reduction), and information extraction

- EEG data analysis at the Berlin Brain-Computer Interface Lab: developed and efficiently implemented new algorithms in MatLab

Research Intern | MIT (Massachusetts Institute of Technology), Cambridge, MA 07/2011 - 10/2011
- at the McGovern Institute for Brain Research / Gabrieli Lab; analyzed fMRI data using Python (published in JAMA Psychiatry)

Student Research Assistant | Fraunhofer Institute for Chemical Technology, Pfinztal 07/2007 - 12/2009
- worked independently, responsible for collection of infrared spectroscopy data

EDUCATION

Ph.D. (Dr. rer. nat.) Computer Science | ML Group, TU (Technical University) Berlin 04/2015 - 04/2020
- in the machine learning group of Prof. Dr. Klaus-Robert Müller; funded by the Elsa Neumann scholarship from the universities of Berlin
- thesis: 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
- supervised bachelor and master students
- graduated magna cum laude

M.Sc. Computer Science | TU Berlin 10/2012 - 03/2015
- focus: intelligent systems (machine learning, big data) & computational neuroscience (at the BCCN)
- thesis: Knowledge Extraction from Complex Biological Texts: A Machine Learning Approach
- graduated top of my class (1.0 on a scale from 1 (best) to 5)

B.Sc. Cognitive Science | University Osnabrück 10/2009 - 09/2012
- interdisciplinary study program including courses in neurobiology, computer science, psychology, artificial intelligence, mathematics, computational linguistics, neuroinformatics, and philosophy; taught in English
- thesis: Comparing and Combining Multiple EEG Features in Motor Imagery BCI - A Large Scale Study
- graduated with distinction (1.1 on a scale from 1 (best) to 5)

Abitur (secondary school) | Fichte-Gymnasium Karlsruhe 09/2000 - 06/2009
- final mark: 1.5 (on a scale from 1 (best) to 5); 11th grade as a year abroad in Missouri (USA)

SKILLS

Leadership

I'm a "get sh*t done (well)" person, who motivates empowered teams through a strong vision and clear priorities, while striving for operational excellence in an agile environment.

- hired and mentored other team members; gave constructive feedback in regular 1:1s and conducted performance reviews
- gathered requirements from external customers and aligned team objectives & KPIs with internal stakeholders
- managed the product backlog and held sprint planning meetings, while ensuring the tasks present growth opportunities for individuals
- facilitated workshops and architectural decision making processes across multiple teams

Software Engineering & Architecture

I design software that's easy to understand, extend, and maintain, turning complex domains into clean, modular architectures.

Programming Languages & Frameworks: Python (incl. Jupyter, streamlit, FastAPI, sklearn, pytorch, pandas, uv, ruff, ty, pytest), SQL (mainly PostgreSQL, SQLite), MatLab, R, Vue.js, Kotlin (incl. Compose Multiplatform)

Tools: git (GitLab & GitHub, incl. CI/CD pipelines), AWS, Grafana, Argo Workflows, Sentry, Terraform, Docker, Kubernetes

Communication

Proficient in professional writing and public speaking, enthusiastic about structuring information, clarifying complex concepts with diagrams, data storytelling, and meticulous editing.

- written two free online books: "A Practitioner's Guide to Machine Learning" and "Clarity-Driven Development of Scientific Software"
- taught 50+ ML training courses to various audiences, ranging from aspiring data scientists to department heads & C-level executives

Languages: German (native), English (fluent), French (basics), Spanish (basics)

PUBLICATIONS

Exploring Word Usage Change with Continuously Evolving Embeddings
Franziska Horn
In *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing: System Demonstrations*, pages 290–297, Online, August 2021. Association for Computational Linguistics (ACL).

Forecasting Industrial Aging Processes with Machine Learning Methods
Mihail Bogojeski, Simeon Sauer, Franziska Horn, Klaus-Robert Müller
Computers and Chemical Engineering, 144:107123, 2021.

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, 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. ACL.

"What is Relevant in a Text Document?": An Interpretable Machine Learning Approach
Leila Arras, Franziska Horn, Gregoire Montavon, Klaus-Robert Müller, 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, Wojciech Samek
In *Proceedings of the 1st Workshop on Representation Learning for NLP*, pages 1–7, Berlin, Germany, August 2016. ACL.

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, 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, Wojciech Samek
arXiv preprint arXiv:1707.06100, 2017.

Exploring text datasets by visualizing relevant words
Franziska Horn, Leila Arras, Gregoire Montavon, Klaus-Robert Müller, 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.