Marvin Schmitt

MACHINE LEARNING SCIENTIST · PHD RESEARCHER

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SUMMARY

Machine learning scientist currently pursuing a PhD in computer science. Specializing in state-of-the-art machine learning algorithms, statistical modeling, and data visualization. 7+ years of hands-on experience in Python and R, with a comprehensive understanding of deep learning tools (TensorFlow and PyTorch). General problem solver with a passion for finding tailored and rigorous solutions to complex problems. Strong analytical skills combined with a talent for effectively communicating advanced concepts.

EXPERIENCE

since 2021   **PhD Researcher**
CLUSTER OF EXCELLENCE SIMTECH, UNIVERSITY OF STUTTGART, GERMANY
- Cyber Valley project: Meta-Uncertainty in Bayesian Model Comparison
- Researched state-of-the-art methods in deep learning, uncertainty quantification, and robustness
- Published scientific papers in top-tier machine learning venues: AISTATS, UAI
- Developed research software for deep learning, trustworthy machine learning, and data visualization
- Managed student assistants and supervised student projects on probabilistic machine learning

2017 – 2019   **Business Consultant**
FREELANCE
- Instructed business workshops on communication, leadership, coaching, conflict, change, and personality
- Programmed a manuscript generation software to create custom training material with Python, Flask, and LaTeX

2017 – 2019   **Network Officer**
MARSILIUS-KOLLEG CENTER FOR ADVANCED STUDY, HEIDELBERG UNIVERSITY, GERMANY
- Implemented a robust live streaming concept based on UDP multicast (internal) and RTMP (external)
- Constructed a network-wide media center based on Samba
- Maintained the website and digital knowledge base in Imperia CMS with HTML, CSS, PHP, and JavaScript

2018   **Research Intern**
QUANTITATIVE RESEARCH METHODS IN PSYCHOLOGY, HEIDELBERG UNIVERSITY, GERMANY
- Developed an algorithm to derive expectation measures from eye-tracking data
- Implemented machine learning methods to improve eye-tracking based usability research

2017   **Consultant Intern**
MC HISCHE CONSULTING
- Advised the preparation and realization of business workshops
- Facilitated a book publication with focus on content, style guidelines, and typesetting

2016 – 2021   **Tutor and Teaching Assistant**
INSTITUTE OF PSYCHOLOGY, HEIDELBERG UNIVERSITY, GERMANY
- Taught seminars and tutorials about statistical inference, probabilistic modeling, and data science
- Conceptualized and graded student assignments, graded exams

EDUCATION

since 2021   **PhD, Computer Science**
CLUSTER OF EXCELLENCE SIMTECH, STUTTGART, GERMANY
- Advisors: Dr. Paul-Christian Bürkner, Prof. Dr. Andreas Bulling
- Expected graduation: 12/2024

2022   **MSc, Data and Computer Science**
HEIDELBERG UNIVERSITY, GERMANY
- Grade 1.0 / 4.0 (A+; best: 1.0)
- Master thesis: Visualization of Distribution and Uncertainty of Posterior Model Probabilities

2021   **MSc, Psychology**
HEIDELBERG UNIVERSITY, GERMANY
- Grade 1.0 / 4.0 (A+; best: 1.0)
- Master thesis: Model Misspecification in Bayesian Parameter Estimation Tasks with Invertible Neural Networks

2018   **BSc, Psychology**
HEIDELBERG UNIVERSITY, GERMANY
- Grade 1.2 / 4.0 (A; best: 1.0)
- Bachelor thesis: Influence of Suggestive Questions on Usability Tests

Teaching

Summer 2022	**Lecture & Exercise,**	Statistical Inference at Fresenius UAS, Heidelberg
Summer 2022	**Exercise,**	Bayesian Statistics and Probabilistic Machine Learning at University of Stuttgart
Winter 2021/22	**Lecture & Exercise,**	Statistical Inference at Fresenius UAS, Heidelberg
Winter 2021/22	**Seminar,**	Introduction to Statistics with R for PhD researchers at Heidelberg University
Summer 2021	**Exercise,**	Descriptive Statistics & Probability Theory at Fresenius UAS, Heidelberg
Summer 2021	**Lecture & Exercise,**	Statistical Inference at Fresenius UAS, Heidelberg
Winter 2020/21	**Seminar (TA),**	Statistics with R at Heidelberg University
Winter 2020/21	**Lecture & Exercise,**	Statistical Inference at Fresenius UAS, Heidelberg
Summer 2020	**Seminar (TA),**	Programming with R at Heidelberg University
2020	**Seminar,**	Communication Techniques at Fresenius UAS, Wiesbaden
2017	**Workshop,**	Group Coaching at Fresenius UAS, Frankfurt
2016–2019	**Tutorial,**	Descriptive Statistics, Probability Theory & Statistical Inference at Heidelberg University

Extracurricular Activities & Awards

2019 – 2021	**Scholarship holder,**	German Academic Scholarship Foundation (Studienstiftung d. dt. Volkes)
2018	**Didactic certificate for tutors,**	Heidelberg University
2016 – 2021	**Elected representative,**	Examination board M.Sc. & Diploma Psychology (break 10/2016 – 09/2017)
2016 – 2021	**Elected representative,**	Institute Council (Fachrat) Psychology
2016 – 2020	**Member,**	Student Council (Fachschaft) Psychology
2014	**Award for remarkable social commitment,**	Auguste-Viktoria-Gymnasium Trier

Selected Involvement

Consultant	Academic consultant in industry for Axem Neurotechnology (since 2022)
Reviewer	Reviewer for international scientific conferences (since 2022): ICML, AISTATS, AABI

Events

2023	**Poster (contributed),**	AISTATS 2023, Valencia, Spain
2023	**Talk (invited),**	Bayes Comp conference, Levi, Finland
2023	**Poster (contributed),**	Bayes Comp conference, Levi, Finland
2022	**Talk (invited),**	Cyber Valley: Writing workshop, consulting on students' AI short stories
2022	**Poster (invited),**	ELLIS Unit Stuttgart Kickoff: *Model misspecification in simulation-based inference*
2022	**Talk (invited),**	Cyber Valley: Office hours, *Where does AI begin?*
2022	**Talk (invited),**	Blue Yonder Group Inc.: *Validating synthetic training data in probabilistic machine learning*
2022	**Participant,**	1st SimTech summer school: Knowledge-driven machine learning and its applications

Skills

Languages	German (native), English (fluent), French (basic), Latin (basic), Norwegian (basic)
Programming	Python, R, occasionally: C++, Java, JavaScript, HTML, CSS
Data Science	Python (Tensorflow/keras, PyTorch, sklearn, scipy, numpy, pandas), R (brms, lme4, afex, tidyverse), Stan
Visualization	Python (matplotlib, seaborn), R (ggplot2, plotly, rgl, shiny, gganimate), OpenGL
Documentation	LaTeX (KOMA, tikZ), git, Imperia, Markdown, RMarkdown, Jupyter, sphinx, roxygen, Quarto

Publications

[1] F. Ewendt*, **M. Schmitt***, A. Kluttig, J. Kühn, F. Hirche, F. B. Kraus, B. Ludwig-Kraus, R. Mikolajczyk, W. Wätjen, P.-C. Bürkner, M. Föller§, and G. I. Stangl§. Association between vitamin d status and eryptosis – results from the german national cohort study. *Annals of Hematology*, 2023.

[2] S. T. Radev, **M. Schmitt**, V. Pratz, U. Picchini, U. Köthe, and P.-C. Bürkner. JANA: Jointly amortized neural approximation of complex bayesian models. In *The 39th Conference on Uncertainty in Artificial Intelligence (UAI)*, 2023.

[3] **M. Schmitt**, S. T. Radev, and P.-C. Bürkner. Meta-uncertainty in bayesian model comparison. In *Proceedings of The 26th International Conference on Artificial Intelligence and Statistics*, volume 206 of *PMLR*, pages 11–29, 2023.

[4] **M. Schmitt**, P.-C. Bürkner, U. Köthe, and S. T. Radev. Detecting model misspecification in amortized Bayesian inference with neural networks. 2021. arXiv:2112.08866.