

Marvin Schmitt

MACHINE LEARNING SCIENTIST · PHD RESEARCHER

✉ mail.marvinschmitt@gmail.com · 🏠 www.marvinschmitt.com · 📷 marvinschmitt · 🐦 @MarvinSchmittML

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
- Initiated and coordinated scientific collaborations with national and international research groups
- 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)
- Coordinated 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

UNIVERSITY OF STUTTGART, GERMANY

- Advisors: Prof. Dr. Paul-Christian Bürkner (TU Dortmund), Prof. Dr. Andreas Bulling (University of Stuttgart)
- ELLIS PhD program, co-supervised by Prof. Dr. Aki Vehtari (Aalto University, Finland)

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	Workshop , Bayesian statistics with R and brms at FGME conference, Konstanz
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

2023 –	Associated student , International Max Planck Research School for Intelligent Systems (IMPRS-IS), Germany
2023	Best paper honorable mention , German Conference on Pattern Recognition
2023	Member , Society of SimTech, Germany
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)
Developer	Core contributor to the BayesFlow open source Python package for amortized Bayesian workflows
Reviewer	Reviewer for international scientific conferences (since 2022): ICML, AISTATS, NeurIPS workshops (AABI2022, DGM4H2023, UniReps2023)

EVENTS

2023	Talk (oral) , German Conference on Pattern Recognition
2023	Talk , ELLIS Doctoral Symposium, Helsinki, Finland
2023	Journal club (moderator) , ELLIS Doctoral Symposium, Helsinki, Finland
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: <i>Model misspecification in simulation-based inference</i>
2022	Talk (invited) , Cyber Valley: Office hours, <i>Where does AI begin?</i>
2022	Talk (invited) , Blue Yonder Group Inc.: <i>Validating synthetic training data in probabilistic machine learning</i>
2022	Participant , 1 st 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, pytest), 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

Full publication list on [Google Scholar](#).

- [1] **M. Schmitt**, D. Habermann, P.-C. Bürkner, U. Köthe, and S. T. Radev. Leveraging Self-Consistency for Data-Efficient Amortized Bayesian Inference, 2023. arXiv preprint
- [2] **M. Schmitt**, P.-C. Bürkner, U. Köthe, and S. T. Radev. Detecting Model Misspecification in Amortized Bayesian Inference with Neural Networks. *45th German Conference on Pattern Recognition (GCPR)*, 2023. Awarded with a best paper honorable mention
- [3] S. T. Radev*, **M. Schmitt***, L. Schumacher, L. Elsemüller, V. Pratz, Y. Schälte, U. Köthe, and P.-C. Bürkner. BayesFlow: Amortized bayesian workflows with neural networks. *Journal of Open Source Software*, 8(89):5702, 2023
- [4] 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 R. J. Evans and I. Shpitser, editors, *Proceedings of the 39th Conference on Uncertainty in Artificial Intelligence*, volume 216 of *Proceedings of Machine Learning Research*, pages 1695–1706. PMLR, 2023
- [5] **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 (AISTATS)*, volume 206 of *PMLR*, pages 11–29, 2023
- [6] 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