Christian Weilbach

Founder and CEO, Simmis

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Education

2018-2025	PhD in Computer Science, University of British Columbia. Structured amortized variational inference, with Frank Wood.
2015-2018	Master's in Computer Science, Heidelberg University. Dictionary learning with Bayesian GANs for few-shot classification.
2011-2015	Bachelor's in Computer Science, Heidelberg University. An online learning algorithm for LIF-based Boltzmann machines.
2006-2011	Philosophy and cultural anthropology, Heidelberg University.
2005-2006	Mathematics and computer science, Heidelberg University.

Grants, honours and awards

2024	Oral presentation at ICML: All-in-one simulation-based inference.
2023	Oral presentation at ICML (top 2.4%): Graphically structured diffusion models.
2023	Google research grant of over 80,000 USD for graphically structured diffusion models, with Frank Wood.
2016	Best poster award, EuroSys, London (replikativ: open P2P replication with CRDTs).

Publications

2025	Y. He, C. Weilbach, M. E. Wojciechowska, Y. Zhang, F. Wood. PLAICraft: Large-Scale Time-Aligned Vision-Speech-Action Dataset for Embodied AI. arXiv 2025.
2025	C. Weilbach, F. Wood. Daphne: Multi-Pass Compilation of Probabilistic Programs into Graphical Models and Neural Networks. TMLR 2025.
2024	M. Gloeckler, M. Deistler, C. Weilbach, F. Wood, J. H. Macke. All-in-one Simulation-Based Inference. ICML 2024. Oral.
2024	R. Fayyazi, C. Weilbach, F. Wood. Prospective Messaging: Learning in Networks with Communication Delays. arXiv 2024.
2023	C. Weilbach, W. Harvey, F. Wood. Graphically Structured Diffusion Models. ICML 2023. Oral, top 2.4%.
2023	A. Campbell, W. Harvey, C. Weilbach, V. De Bortoli, T. Rainforth, A. Doucet. Trans-Dimensional Generative Modeling via Jump Diffusion Models. NeurIPS 2023.
2023	C. Weilbach, W. Harvey, H. Shirzad, F. Wood. Scaling Graphically Structured Diffusion Models. ICML workshop on structured probabilistic inference and generative modeling 2023.
2023	G. Gonzalez Garcia, C. Weilbach. If the Sources Could Talk: Evaluating Large Language Models for Research Assistance in History. Computational Humanities Research 2023.
2022	W. Harvey, S. Naderiparizi, V. Masrani, C. Weilbach, F. Wood. Flexible Diffusion Modeling of Long Videos. NeurIPS 2022.
2022	F. Wood, A. Warrington, S. Naderiparizi, C. Weilbach, V. Masrani, W. Harvey, et al.. Planning as Inference in Epidemiological Dynamics Models. Frontiers in Artificial Intelligence 2022.
2021	J. Weilbach, S. Gerwinn, C. Weilbach, M. Kandemir. Inferring the Structure of Ordinary Differential Equations. ICML time series workshop 2021.
2021	B. Beronov, C. Weilbach, F. Wood, T. Campbell. Sequential Core-Set Monte Carlo. UAI 2021.

2020	C. Weilbach, B. Beronov, F. Wood, W. Harvey. Structured Conditional Continuous Normalizing Flows for Efficient Amortized Inference in Graphical Models. AISTATS 2020.
2019	C. Weilbach, B. Beronov, W. Harvey, F. Wood. Efficient inference amortization in graphical models using structured continuous conditional normalizing flows. Symposium on Advances in Approximate Bayesian Inference.
2017	C. Weilbach, A. Bieniusa. Time-sensitive probabilistic inference for the edge. technical report, arXiv 2017.
2016	C. Weilbach, K. Kühne, A. Bieniusa. Decoupling Conflict Resolution with CDVCS. PaPoC workshop at EuroSys 2016. With the replikativ poster, best poster award at EuroSys 2016.
2016	C. Weilbach, K. Kühne, A. Bieniusa. replikativ: open P2P replication with CRDTs. Poster, EuroSys, London.

Talks

2026	Rationalizing a Society of Learners. Max Planck Institute for Intelligent Systems, Tübingen.
2026	Programming as and for inference. London Clojurians.
2025	Partially evaluating higher-order probabilistic programs without stochastic recursion to graphical models. LAFI workshop at POPL.
2024	Flexible diffusion models for videos, molecules, and inference in structured simulators. Google DeepMind, London.
2023	Video and graphically structured diffusion models. OpenAI, San Francisco.
2023	Graphically structured diffusion models. Mila, Montréal.
2019	Anglican: Turing-complete functional probabilistic programming as a domain-specific language. Trends in Functional Programming.
2019	Datalog as a distributed systems language. Clojure Meetup Vancouver.
2017	Let's replicate state together. clojureD, Berlin.
2017	Machine learning workshop. CubaConf, Havana.

Projects

2025–	Simmis: a workspace in which people and AI agents share one memory (chat, wiki, knowledge bases, double-entry accounts, code), with work done in branches and adopted by review.
2026	Klara: a language for recursive self-improvement. Running programs keep versioned worlds, specialise themselves with staged, untrusted optimisers, and admit changes through a small kernel with proofs checked in Ansatz.
2026	Ansatz, a dependently typed Clojure DSL with a Lean 4 compatible kernel; Wandler, verified transducer optimisation.
2026	Foerster: probabilistic inference in forkable worlds (SMC, particle MCMC, HMC, variational inference, counterfactuals), and a data-grounded simulation of Stuttgart with 936,597 agents and Bayesian inference over its parameters.
2026	Raster: functional numerical computing that compiles one algebra to each device, with ports of UMAP, EVoC and pretrained Hugging Face models to the JVM.
2026	Spindel, a reactive runtime with forkable state; partial-cps; Dvergr, an agent framework with forkable memory and measured workflows.
2026	Datahike ecosystem: Yggdrasil, Proximum, Stratum, Scriptum, Geschichte and pg-datahike.
2026	Kontor, an accounting kernel; Superficie, a readable surface syntax for Clojure; contributions to PyMC-Marketing.
2026	Open migration databases with Dr. Giselle González García: the Cuba–Ireland Immigration Database and Redes Isleñas, built on Datahike and Spindel.

2023-	PLAICraft: large-scale multimodal data collection of multi-agent Minecraft play. Led 11 volunteers and several students on architecture and code.
2019–2022	Daphne: a compiler from first-order probabilistic programs to graphical models and structured normalizing flows; adapted for teaching a graduate course in probabilistic programming at UBC.
2018	Datahike: design and development of a Datalog database on persistent data structures.
2017	A reverse-mode autograd for Clojure.
2016	Bayesian dropout for recursive neural networks in sentiment analysis; dropout as a Gaussian process approximation; complex knowledge-base embeddings.
2015	Research assistant in the Human Brain Project, extending my Bachelor thesis; a Boltzmann machine library for contrastive divergence with STDP.
2013-	replikativ: distributed state management with CRDTs.

Commercial work

2025-	Founder and CEO of Simmis.
2025	Python port and modernisation of the PCA implementation of pol.is.
2019-	Consulting for the deployment of Datahike at the Swedish Public Employment Service.
2018-	Founder of LambdaForge UG.
2018	Improvements to the probabilistic programming system Anglican.
2016–2017	Design and implementation of a backend and apps for feebame UG.
2016	Reachability analysis and callee prediction with Bayesian deep learning for Keatec GmbH, Frankfurt.
2014–2015	Statistical analysis of medical data for BMI Heidelberg.

Teaching and community

2020	Organiser, Vancouver Julia Meetup.
2017–2018	Teaching assistant, Master's lecture “Fundamentals of Machine Learning”, Heidelberg University.
2017	Cornell, Maryland, Max Planck Pre-doctoral Research School, Saarbrücken.
2015–2018	Co-organiser, Clojure Meetup Mannheim-Heidelberg; organiser, Machine Learning Meetup Rhein-Neckar.

Languages

German (native), English (fluent), French (basic).