

Daniel Gedon

Postdoctoral Fellow in Machine Learning · Tübingen AI Center, University of Tübingen

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RESEARCH INTERESTS

Probabilistic machine learning, generative models, AI for scientific discovery, simulation-based inference, foundation models and LLMs, model discovery, uncertainty quantification.

TECHNICAL SKILLS

Languages & frameworks: Python (PyTorch, scikit-learn, numpy, pandas), Git

Infrastructure: SLURM, Hydra, Ray, Linux HPC clusters

Methods: Bayesian inference, simulation-based inference, generative models, sampling methods, transformers and LLMs (including pre-training from scratch), uncertainty quantification, hyperparameter optimization

PROFESSIONAL EXPERIENCE

Postdoctoral Fellow, Tübingen University, Tübingen AI Center, Germany

Sep 2024 – Present

Advisor: Jakob H. Macke

- Research on probabilistic ML and LLMs for AI-driven scientific discovery: LLM-based automated model discovery, and generative models and neural density estimation for simulation-based inference.
- Maintainer of `sbi` (800+ GitHub stars), a Python package for simulation-based inference.
- Student supervision, mentoring, and co-organization of SBI hackathons.

Satellite Attitude Control System Analyst, Airbus Defence & Space, Germany

Oct 2015 – Sep 2016

- High-precision satellite pointing error analysis using ESA PEET simulation software.
- AOCS/GNC system concept design for early-phase satellite missions.
- Sensor modeling and functional simulation of attitude determination.

EDUCATION

Ph.D. in Machine Learning, Uppsala University, Sweden

Aug 2019 – Aug 2024

Advisor: Thomas B. Schön · Thesis: *On Deep Learning for Low-Dimensional Representations* [Thesis]

Topics: deep learning for clinical ECG analysis, deep state-space models for system identification, self-supervised and kernel methods for representation learning

Visiting researcher, Belkin lab, UC San Diego, Spring 2023

M.Sc. in System and Control, TU Delft, Netherlands

Sep 2017 – Jul 2019

Thesis: *Tensor Network Kalman Filter for Large-Scale MIMO Systems* [Thesis]

B.Eng. in Aerospace Engineering, DHBW, Germany

Sep 2012 – Sep 2015

OPEN-SOURCE SOFTWARE

sbi

2024 – present

Python package for simulation-based inference. 800+ GitHub stars. Maintainer. [github]

GRANTS & AWARDS

AI for Science Program, Anthropic

Spring 2026

\$20,000 in Claude API credits for life science application

WASP Postdoctoral Fellowship, Knut and Alice Wallenberg Foundation

Spring 2024

Two-year scholarship at the Institute of Science and Technology Austria (ISTA). Awarded; declined.

WASP Research Grant, Knut and Alice Wallenberg Foundation
Funding for three-month research visit to Mikhail Belkin's lab, UC San Diego.

Spring 2023

ACADEMIC SERVICE

Organization

SBI Hackathon (5 days), Tübingen, Germany [website]	Mar 2025
SBI Hackathon/Tutorial (3 days), Grenoble, France [website]	Jan 2026
Sim2Science NeurIPS workshop, Paris, France [website]	Dec 2026

Peer Review

ML venues: NeurIPS (2023–2026), ICLR (2024–2025), ICML (2025), AISTATS (2023–2024), UAI (2025)
Other conferences: IFAC WC (2023), CDC (2023), ECC (2023), MIR (2024), IEEE CCTA (2023)
Journals: Automatica (2023), IEEE CSS (2025), IEEE TC-SMC (2023), IEEE TIM (2023), IEEE Access (2023), BMJ (2022)

SUPERVISION AND MENTORING

Johannes Schmidt, GSoC contributor (sbi), University of Bonn	2026 – present
Anupam Sourav Patra, student assistant, Tübingen University	2026 – present
Ahmet Alperen Güngör, student assistant, Tübingen University	2026 – present
Stefan Wahl, PhD student, Tübingen University	2025 – present
Philipp von Bachmann, MSc project, Uppsala University	Spring 2022
Theogene Habineza, MSc thesis, Uppsala University	Spring 2022

TEACHING

Teacher , Tübingen University, Germany	Sep 2024 – present
Seminar: Simulation-based inference (MSc) — Spring 2025	
Teamproject: Benchmarking for Misspecified SBI (BSc) — Spring 2025	
Seminar: Diffusion models (MSc) — Fall 2025	
Lecturer , Uppsala University, Sweden	Sep 2023 – Aug 2024
Advanced Probabilistic Machine Learning, iRT705 (MSc), Fall 2023	
Teaching Assistant , Uppsala University & TU Delft	Oct 2018 – Aug 2024
Statistical ML, Advanced Probabilistic ML, System Identification, AI & ML for WASP PhD school — MSc/PhD level	

TALKS

<i>Simulation-based inference and probabilistic model discovery with foundation models</i> KTH, Stockholm	Jun 2026
<i>Simulation-based inference and probabilistic model discovery with foundation models</i> Chalmers, Gothenburg	Jun 2026
<i>Simulation-based inference and probabilistic model discovery with foundation models</i> Aiz, Seattle	Dec 2025
<i>Deep Networks for System Identification: A Survey</i> ERNSI Workshop, Stockholm	Sep 2023
<i>No Double Descent in PCA: Training and Pre-Training in High Dimensions</i> Belkin Lab Group Meeting, UC San Diego	Mar 2023
Panel: <i>Training in Data Driven Life Science</i> SciLifeLab DDLS Annual Conference, Stockholm	Nov 2022
<i>Deep Learning-based ECG Reading in the Emergency Department</i> Joint DSBS / FMS Meeting, Malmö	Nov 2022

OTHER EXPERIENCE

Solo Travel

Oct 2016 – Apr 2017

Long-distance hike, Greater Patagonian Trail, Patagonia. Language school: Spanish (Sucre, Bolivia).

Voluntary Work

Apr 2017 – Aug 2017

Work with primary school children, elderly, and refugees. Ansbach, Germany.

LANGUAGES

German (native) · English (fluent) · Swedish (intermediate) · Spanish (beginner)

PUBLICATIONS

* denotes equal contribution / joint supervision.

Preprints

1. **Mixed neural posterior estimation for simulators with discrete and continuous parameters**
Jan Boelts, Cornelius Schröder, Jonas Beck, Jakob H. Macke*, Michael Deistler*, **Daniel Gedon***
arXiv, 2026 [arXiv]

Peer-Reviewed Publications

1. **A Probabilistic Framework for LLM-Based Model Discovery**
Stefan Wahl, Raphaela Schenk, Ali Farnoud, Jakob H. Macke, **Daniel Gedon**
ICML, 2026 [arXiv] [OpenReview] [code]
2. **A Deep Learning ECG Model for Localization of Occlusion Myocardial Infarction**
Stefan Gustafsson, Antônio H. Ribeiro, **Daniel Gedon**, Petrus E.O.G.B. Abreu, Nicolas Pielawski, Gabriela M.M. Paixão, Antonio Luiz P. Ribeiro, Daniel Lindholm, Thomas B. Schön, Johan Sundström
Nature Communications, 2026 [DOI] [code]
3. **Effortless, Simulation-Efficient Bayesian Inference using Tabular Foundation Models**
Julius Vetter, Manuel Gloeckler, **Daniel Gedon***, Jakob H. Macke*
NeurIPS, 2025 [arXiv] [OpenReview] [code]
4. **Deep Networks for System Identification: A Survey**
Gianluigi Pillonetto, Aleksandr Aravkin, **Daniel Gedon**, Lennart Ljung, Antônio H. Ribeiro, Thomas B. Schön
Automatica, 2025 [DOI] [arXiv]
5. **No Double Descent in Principal Component Regression: A High-Dimensional Analysis**
Daniel Gedon, Antônio H. Ribeiro, Thomas B. Schön
ICML, 2024 [OpenReview] [ICML] [code]
6. **Uncertainty Estimation with Recursive Feature Machines**
Daniel Gedon, Amirhesam Abedsoltan, Thomas B. Schön, Mikhail Belkin
UAI, 2024 [OpenReview] [code]
7. **Evaluating Regression and Probabilistic Methods for ECG-based Electrolyte Prediction**
Philipp Von Bachmann, **Daniel Gedon**, Fredrik K. Gustafsson, Antônio H. Ribeiro, Erik Lampa, Stefan Gustafsson, Johan Sundström, Thomas B. Schön
Scientific Reports 14, 15273, 2024 [DOI] [arXiv] [code]
8. **End-to-end Risk Prediction of Atrial Fibrillation from the 12-Lead ECG by Deep Neural Networks**
Theogene Habineza, Antônio H. Ribeiro, **Daniel Gedon**, Joachim A. Behar, Antonio Luiz P. Ribeiro, Thomas B. Schön
Journal of Electrocardiology, 2023 [DOI] [arXiv] [code]
9. **Screening for Chagas Disease from the Electrocardiogram using a Deep Neural Network**
Carl Jidling, **Daniel Gedon**, Thomas B. Schön, Claudia Di Lorenzo Oliveira, Clareci Silva Cardoso, Ariela Mota

- Ferreira, Luana Giatti, Sandhi Maria Barreto, Ester C. Sabino, Antonio L. P. Ribeiro, Antônio H. Ribeiro
PLOS Neglected Tropical Diseases, 2023 [DOI] [medRxiv] [code]
10. **Invertible Kernel PCA with Random Fourier Features**
Daniel Gedon, Antônio H. Ribeiro, Niklas Wahlström, Thomas B. Schön
IEEE Signal Processing Letters, 2023 [DOI] [arXiv] [code]
 11. **Development and Validation of Deep Learning ECG-based Prediction of Myocardial Infarction in Emergency Department Patients**
Daniel Gedon^{*}, Stefan Gustafsson^{*}, Erik Lampa, Antônio H. Ribeiro, Martin J. Holzmänn, Thomas B. Schön, Johan Sundström
Scientific Reports 12, 19615, 2022 [DOI]
 12. **First Steps Towards Self-Supervised Pretraining of the 12-Lead ECG**
Daniel Gedon, Antônio H. Ribeiro, Niklas Wahlström, Thomas B. Schön
Computing in Cardiology (CinC), 2021 [DOI] [slides] [video]
 13. **Deep State Space Models for Nonlinear System Identification**
Daniel Gedon, Niklas Wahlström, Thomas B. Schön, Lennart Ljung
Proceedings of the 19th IFAC Symposium on System Identification (SYSID), 2021 [DOI] [arXiv] [code]
 14. **Automatic 12-Lead ECG Classification using a Convolutional Network Ensemble**
 Antônio H. Ribeiro, **Daniel Gedon**, Daniel Martins Teixeira, Manoel H. Ribeiro, Antonio L. Pinho Ribeiro, Thomas B. Schön, Wagner Meira Jr.
Computing in Cardiology (CinC), 2020 [DOI] [code]
 15. **Tensor Network Kalman Filter for LTI Systems**
Daniel Gedon, Pieter Piscaer, Kim Batselier, Carlas Smith, Michel Verhaegen
27th European Signal Processing Conference (EUSIPCO), A Coruña, Spain, 2019 [DOI] [code]
 16. **PointingSat – High Precision Pointing Error Analysis with ESA PEET v1.0**
 Thomas Ott, Marc Hirth, Massimo Casasco, Simon Görries, **Daniel Gedon**, Alison Ponche
10th International ESA Conference on Guidance, Navigation & Control Systems, Salzburg, Austria, 2017 [Paper]