

# Daniel Gedon

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

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## RESEARCH INTERESTS

Scientific discovery, simulation-based inference, probabilistic machine learning, foundation models and LLMs, model discovery, uncertainty quantification.

*Technical:* Python (PyTorch, scikit-learn, numpy, pandas, ...), Git, SLURM, Hydra.

*Methods:* Transformers, LLMs, Bayesian inference, uncertainty quantification, hyperparameter optimization, data preprocessing/feature engineering.

## PROFESSIONAL EXPERIENCE

**Postdoctoral Fellow**, Tübingen University, Tübingen AI Center, Germany Sep 2024 – Present  
Advisor: Jakob H. Macke

- Research at the intersection of probabilistic machine learning and large language models, with a focus on automated scientific model discovery and simulation-based inference.
- Student supervision, mentoring, and organization of community events.

**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]  
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. Maintainer. [github]

## GRANTS & AWARDS

**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 Spring 2023  
Funding for three-month research visit to Mikhail Belkin's lab, UC San Diego.

## ACADEMIC SERVICE

### Peer Review

*ML venues:* NeurIPS (2023–2025), 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)

## Organization

SBI Hackathon (5 days), Tübingen, Germany  
SBI Hackathon/Tutorial (3 days), Grenoble, France

Mar 2025  
Jan 2026

## SUPERVISION

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

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

## INVITED TALKS

<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

<b>Solo Travel</b> Long-distance hike, Greater Patagonian Trail, Patagonia. Language school: Spanish (Sucre, Bolivia).	Oct 2016 – Apr 2017
<b>Voluntary Work</b> Work with primary school children, elderly, and refugees. Ansbach, Germany.	Apr 2017 – Aug 2017

## LANGUAGES

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

## PUBLICATIONS

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\* denotes equal contribution / joint supervision.

### Peer-Reviewed Publications

1. **Effortless, Simulation-Efficient Bayesian Inference using Tabular Foundation Models**  
Julius Vetter, Manuel Gloeckler, **Daniel Gedon\***, Jakob H. Macke\*  
*NeurIPS*, 2025 [arXiv] [OpenReview] [code]
2. **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]
3. **No Double Descent in Principal Component Regression: A High-Dimensional Analysis**  
**Daniel Gedon**, Antônio H. Ribeiro, Thomas B. Schön  
*ICML*, 2024 [OpenReview] [ICML] [code]
4. **Uncertainty Estimation with Recursive Feature Machines**  
**Daniel Gedon**, Amirhesam Abedsoltan, Thomas B. Schön, Mikhail Belkin  
*UAI*, 2024 [OpenReview] [code]
5. **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]
6. **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]
7. **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]
8. **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]
9. **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. Holzmann, Thomas B. Schön, Johan Sundström  
*Scientific Reports* 12, 19615, 2022 [DOI]
10. **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]
11. **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]
12. **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]

13. **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]
14. **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]

## Preprints

1. **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  
*medRxiv*, submitted to *Nature Communications*, 2025 [medRxiv]
2. **A Probabilistic Framework for LLM-Based Model Discovery**  
Stefan Wahl, Raphaela Schenk, Ali Farnoud, Jakob H. Macke, **Daniel Gedon**  
*arXiv*, 2026 [arXiv]