Manuel Gloeckler

PhD student at the University of Tübingen

Date of Birth: May 29, 1998

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Interests

- Bayesian inference
- Simulation-based inference
- Generative models
- probabilistic and differentiable programming

Skills

Programming:

- Python
- Bash scripting
- Java
- Cuda/C/C++

Tools:

- JAX
- PyTorch
- Hydra/SLURM
- TensorFlow/Keras

Languages

German (Mother Tongue)

English (Proficient)

French (B1, 2016)

Working Experience

Apr 2022 – ongoing — **PhD student** — **University of Tübingen, DE**
Working as a researcher at the University of Tübingen in the Cluster of Excellence - Machine Learning in Science, supervised by Prof. Dr. Jakob Macke. Member of the International Max Planck Research School for Intelligent Systems (IMPRS-IS). Research on simulation-based (or likelihood-free Bayesian) inference methods, focusing on robustness and efficiency.

Sep 2020 – Feb 2022 — **Research Assistant** — **University of Tübingen, DE**
Worked as a research assistant in the Computational Systems Biology Group, supervised by Dr. Reihaneh Mostolizadeh. The research focused on the computational analysis of microbiota interactions in the human nasal microbiome through genome-scale modeling.

Feb 2019 – Oct 2019 — **Student Assistant** — **University of Tübingen, DE**
Teaching assistant in the Theory of Machine Learning Group of Prof. Dr. Ulrike von Luxburg.

Education

Mar 2022 – Oct 2019 — **M.Sc. in Bioinformatics** — **University of Tübingen, DE**
Focused on machine learning methods and theory and their applications in life sciences. Graduation with distinction [certificate].
Thesis: *Variational Methods for Simulation-Based Inference* [pdf].
Supervisors: Dr. Jakob Macke, Dr. Manfred Classen
Average grade: 1.15 (3.9 GPA equivalent)
| Detailed List of Grades

Sep 2019 – Oct 2016 — **B.Sc. in Bioinformatics** — **University of Tübingen, DE**
Graduation with distinction [certificate].
Thesis: *The Landscapes of CD8+ T Cell Immunogenicity from a Self-Tolerance-Based Perspective in Sequence Space* [pdf].
Supervisors: Dr. Leon Kuchenbecker, Dr. Oliver Kohlbacher
Average grade: 1.31 (3.7 GPA equivalent)
| Detailed List of Grades

Other Training

Jul 2022 — **Cambridge ELLIS Machine Learning Summer School** — **Cambridge, UK**
Participation in the summer school and poster presentation [certificate].

Jul 2021 — **Machine Learning Summer School** — **Taipei, Online (Cov19)**
Participation in the summer school [certificate].

Teaching Experience

Teaching assistant

University of Tübingen

ML4202: Probabilistic Machine Learning — Summer'22,24
Graduate course.

ML 4102: Data Literacy — Winter'22
Graduate course about basic data science methods.

INFO4412: Algorithms and Complexity — Winter'19
Undergraduate course about algorithms and complexity analysis.

Academic Supervision

2023 — Amortizing simulation-based inference over different prior distributions (Stacey Naduvilpurakal) — M.Sc.

Short Bio

My name is Manuel Gloeckler, and I am currently a PhD student employed at the University of Tübingen with a Master's degree in Bioinformatics. I am an accomplished programmer and enjoy using my skills to develop methods to solve general scientific inverse problems. After graduating in 2022, I successfully contributed to a major international machine learning conferences.

Metrics

Profiles

Publications

Published

Machine Learning / AI

2024 **All-in-one simulation-based inference** [arxiv]
Manuel Gloeckler, Michael Deistler, Christian Weilbach, Frank Wood, Jakob H. Macke
Accepted as a **oral** for ICML 2024 (top 5%)

2023 **Adversarial robustness of amortized Bayesian inference** [arxiv].
Manuel Gloeckler, Michael Deistler, Jakob H. Macke.
Accepted as a *poster* for ICML 2023

2022 **Variational methods for simulation-based inference** [arxiv].
Manuel Gloeckler, Michael Deistler, Jakob H. Macke.
Accepted as a **spotlight** for ICLR 2022 (top 6 %).

Sys. biology

2023 **Hierarchical modelling of microbial communities**
Manuel Gloeckler, A Dreager, R Mostolizadeh

2022 **NCMW: a python package to analyze metabolic interactions in the nasal microbiome** [frontiers].
Manuel Gloeckler, Andreas Draeger, Reihaneh Mostolizadeh

2022 **Towards the human nasal microbiome: Simulating D. pigrum and S. aureus** [frontiers].
Reihaneh Mostolizadeh, Manuel Gloeckler, Andreas Draeger

Pre-prints

2024 **Differentiable simulation enables large-scale training of detailed biophysical models of neural dynamics** [bioarxiv]
Michael Deistler, Kyra L Kadhim, Matthijs Pals, Jonas Beck, Ziwei Huang, Manuel Gloeckler, Janne K Lappalainen, Cornelius Schröder, Philipp Berens, Pedro J Gonçalves, Jakob H Macke

2024 **Inferring stochastic low-rank recurrent neural networks from neural data** [arxiv]
Matthijs Pals, A. Erdem Sagtekin, Felix Pei, Manuel Gloeckler, Jakob H. Macke

2024 **A practical guide to statistical distances for evaluating generative models in science** [arxiv]
Bischoff et. al (21 authors alphabetically sorted, role as a co-organizer)

Review Duties

Journal	IOP Trusted reviewer [certificate]
Conferences	ICLR 2024, ICLR 2025

Open source contributions

SBI	Core maintainer, Contributor	560 stars

References

Ref. 1	**Prof. Dr. Jakob Macke** jakob.macke@uni-tuebingen.de	University of Tübingen, DE
Ref. 2	**Dr. Reihaneh Mostolizadeh** reihaneh.mostolizadeh@uni-tuebingen.de	University of Tübingen, DE