Curriculum vitae and track record

I. PERSONAL DETAILS

Prof. Gilles Louppe
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Education and key qualifications

2010–2014	Ph.D., Computer Science University of Liège, Belgium Supervisor: Prof. Pierre Geurts Thesis: *Understanding Random Forests – From Theory to Practice*
2008–2010	M.Sc., Computer Science (Summa Cum Laude) University of Liège, Belgium
2005–2008	B.Sc., Computer Science (Summa Cum Laude) University of Liège, Belgium

Current position(s)

2023–Present	Professor (Professeur) Faculty of Applied Sciences, University of Liège, Belgium

Previous position(s)

2017–2022	Assistant Professor (Chargé de cours) Faculty of Applied Sciences, University of Liège, Belgium
2015–2017	Postdoctoral Associate Center for Data Science, New York University, USA Center for Cosmology and Particle Physics, New York University, USA
2014–2015	Marie-Curie Research Fellow CERN, Switzerland
2010–2014	FRS-FNRS Research Fellow Faculty of Applied Sciences, University of Liège, Belgium

II. RESEARCH ACHIEVEMENTS AND PEER RECOGNITION

Research achievements

Trained as a computer scientist, I view and investigate AI as a way to understand the world around us. In pursuit of this objective, my research efforts have been focused on deep generative models, approximate Bayesian inference, and applications thereof in the physical sciences. I am at the origin of a new generation of algorithms for simulation-based inference based on deep neural networks and have been developing and leading this research track ever since. The methodology we have built and improved over the years has been successfully validated on a range of scientific problems, through international collaborations with domain scientists in particle physics, astrophysics, astronomy, biophysics and neuroscience. The next frontier of my research work is to scale up these methods to high-dimensional inference problems found in Earth and climate sciences.

Summary of my track record. (as of June 2024) 62 refereed publications in international conference proceedings (incl. 15+ at NeurIPS, ICML, AISTATS) or in journals, 24 refereed publications in international workshops, and 120 publications overall (incl. pre-prints). My h-index is 35, my i10-index is 62, and my citations count is above 105000 (Google Scholar). The exhaustive list of my publications is available at https://bit.ly/3MzUfXQ.

Publication strategy. **In machine learning, publications at international conferences are the main form of dissemination**. The main conferences (incl. NeurIPS, ICML or ICLR) are among the most impactful venues across all scientific disciplines [https://bit.ly/4a4k4cI]. They are highly competitive, with acceptance rates of 25% or less, and only publish peer-reviewed papers presenting original research. The main conferences are complemented by workshops, which are less selective and publish papers that are not necessarily peer-reviewed with the same level of scrutiny. **Submissions to machine learning journals are less common, as they are often less selective and less impactful than tier-1 conference papers.**

My publication strategy aims to prioritize conference papers as they offer a prime opportunity to present innovative research, undergo rigorous peer review, and gain visibility within the ML community. By targeting tier-1 AI conferences, I can ensure that my work receives the recognition and scrutiny necessary for establishing credibility and advancing knowledge in the field. Since 2017, I primarily assume the position of the last author, as I prioritize the front-line involvement of my researchers and PhD students. I co-design, guide, and supervise their research work and co-write their papers, allowing them to gain valuable experience and recognition for their contributions while fostering a collaborative research environment.

Peer recognition

Invited talks The exhaustive list of my talks (111 in total) is available at https://bit.ly/4a09KTa. Among those, 5 notable invited talks are:

(1) G. Louppe. "Inverting scientific images with score-based generative models", 3rd Workshop on Uncertainty Quantification for Computer Vision, ECCV 2024. Milano, Italy, September 30, 2024. https://orbi.uliege.be/handle/2268/323570
(2) G. Louppe. "An introduction to simulation-based inference", 51st SLAC Summer Institute, Stanford, USA, August 16 2023. https://hdl.handle.net/2268/309381
(3) G. Louppe. "Simulation-based inference: Proceed with caution!." CAP-RFIAP 2022 (Conférence Française sur l'Apprentissage Machine), Vannes, France, July 2022. Keynote speaker.
(4) G. Louppe. "The frontier of simulation-based inference." AIMS Seminar Series. Oxford, UK, February 12, 2021. http://hdl.handle.net/2268/256816
(5) G. Louppe. "Neural Likelihood-free Inference." GRAPPA colloquium. Amsterdam, The Netherlands, November 19, 2019. http://hdl.handle.net/2268/241474

Fellowships and memberships

2023–Present Member of the "Société Royale des Sciences de Liège"
2021–Present Board member of the "Benelux Association for Artificial Intelligence" (BNVKI)
2021–Present President of the scientific advisory board of the "Trusted AI Labs Institute" (TRAIL)
2018–Present Member of the "ELLIS Society"

III. ADDITIONAL INFORMATION

Close scientific collaborators

Particle physics: Kyle Cranmer (University of Wisconsin-Madison), Johann Brehmer (New York University), Michael Kagan (SLAC/Stanford), David Rousseau (Université Paris-Saclay), Tilman Plehn (Heidelberg University), Fabio Maltoni (UCLouvain); Astrophysics: Siddharth Mishra-Sharma (MIT), Christoph Weniger (University of Amsterdam), Joshua Bloom (UC Berkeley); Astronomy: Olivier Absil (ULiège); Biophysics: Namid Stillman (University College London); Geoscience: Marilaure Grégoire (ULiège), Xavier Fettweis (ULiège).

Engagement in the research system

Conference and workshop co-organizer

2024 Simulation-based inference in fundamental physics, PHYSTAT workshop.

2020–2023 Machine Learning and the Physical Sciences, NeurIPS workshop.
2023 Synergy of Scientific and Machine Learning Modeling, ICML workshop.
2016 Data Science @ HEP at the Simons Foundation.
2015 Data Science @ LHC Workshop.

Program committees
2022–Present Recurrent area chair-for NeurIPS, ICML, ICLR and AISTATS.
2014–2022 Recurrent peer-reviewer for NeurIPS, ICML, ICLR and AISTATS.

Dissertation committees
Member of the evaluation committee of 25+ PhD theses, both locally and internationally.

Academic supervision

PhD Students
2017–2022 Joeri Hermans, “Advances in Simulation-based inference”
2018–2022 Antoine Wehenkel, “Inductive bias in deep probabilistic modelling”
2018–2024 Norman Marlier, “Simulation-based inference for robotic grasping”
2019–2024 Maxime Quesnel, “Deep learning-based wavefront sensing for exoplanet imaging”
2019–Present Malavika Vasist, “Simulation-based inference for exoplanet characterization”
2020–Present Arnaud Delaunoy, “Reliable simulation-based inference”
2021–Present François Rozet, “Simulation-based inference for large-scale dynamical systems”
2021–Present Omer Rochman, “Scientific emulators with deep neural networks”
2023–Present Gérome Andry, “Overcoming model misspecification with deep learning”
2023–Present Victor Mangeleer, “Understanding submesoscale oceanic processes with deep learning”
2023–Present Sacha Lewin, “Infinite-dimensional deep generative models for spatiotemporal data”
2023–Present Adrien De Voeght, “Deep learning-based analysis of cytometry data”
2024–Present Lénea Luis, “Simulation-based inference for particle physics”

MSc Students Since 2017, I have supervised 55 MSc students on various topics in deep learning and approximate Bayesian inference. The exhaustive list is available at https://bit.ly/3SpWOzC.

Teaching

Multi-year teaching of "Introduction to AI", "Foundations of Data Science", "Deep Learning" and "Advanced Machine Learning". Materials are all open source and publicly available at https://glouppe.github.io/teaching.

Software

Core developer of the Scikit-Learn library for machine learning in Python, from 2010 to 2015. This library is now the most popular machine learning library in Python, with more than 1.5M downloads per day.