PhD (f/m/x) in Machine Learning for Scientific Modeling

Affiliations: Technical University of Munich (TUM) & Helmholtz Munich

Niki Kilbertus invites applications for a fully funded PhD position. We're looking for a creative and motivated individual passionate about developing ML methods to tackle challenges in scientific modeling.

About us and the role

Our group operates across the Helmholtz Munich Campus [maps] and the TUM Garching campus [maps], and all members are affiliated with both institutes. As a PhD candidate in our group, you will drive your own research on machine learning methods in close collaboration with the other group members including Niki and external collaborators. Niki's primary goal is to empower you to become a creative, independent researcher, ready to lead your own group in the future. Hence, you will have substantial freedom to define projects.

We focus on methods-driven ML for scientific modeling, currently emphasizing the integration of data-driven and mechanistic approaches for dynamical systems, causality, and ML for science more broadly. We publish at core ML venues and are also interested in collaborating on applications in biomedicine, climate, or physics. Find out more at nikikilbertus.info.

How you'll succeed

We are looking for a candidate who is enthusiastic about research and eager to learn. We hire for potential, group fit, and research taste, not checklists. We explicitly encourage applications from diverse and unconventional backgrounds.

- Be curious and audacious, ask questions, and relentlessly strive for understanding.
- Value the social and collaborative nature of science, be proactive, eager to share ideas, give and receive feedback, and contribute to the group.
- Own your research and see projects through from conception to publication.
- Keep learning. Find and master the best tools/techniques for the problem at hand.
- Turn ambiguous scientific questions into concrete tractable problems you can solve.
- Be equally passionate about rigorous mathematical reasoning and hands-on Python implementation (PyTorch, JAX, …) in HPC environments.
- Communicate clearly in English, both written (papers) and spoken (presentations).
- **Prerequisite:** An MSc degree or equivalent (or close to finishing) in a relevant field.

What we offer

- Fixed-term fully funded PhD position for 3 years, with possible extension to 4.
  Contract is limited for qualification (doctoral degree) in line with WissZeitVG
- Salary according to the German public sector pay (TV-L/TVöD, E13, 100%).
- 30 days paid leave and high flexibility in where and when you work.
- Access to HPC resources (including GPU clusters) at Helmholtz, the Leibniz Supercomputing Centre (LRZ), and the Forschungszentrum Jülich (FZJ).
- Training and networking opportunities within the vibrant Munich AI ecosystem and within structured graduate programs, the Munich Centre for Machine Learning (MCML), the Munich Data Science Institute (MDSI), the local ELLIS unit, and more.
- A generous budget for attending conferences, workshops, and summer schools.

How to apply

If you plan to **start your PhD after May 2026, please do not apply directly**, but instead apply to the following programs and mention me as possible supervisor:

- ELLIS (deadline Oct 31): https://ellis.eu/news/ellis-phd-program-call-for-applications-2025
- MCML (call coming soon): https://mcml.ai/opportunities/for-students/
- relAI (deadline likely Dec 2025): https://zuseschoolrelai.de/application/

If you plan to start before May 2026 (and only then), please send your application as a **single PDF file** in English to niki.kilbertus@tum.de with the subject line "**PhD Application: [Your Last Name]**". The application should contain:

- **Research statement/proposal (max. 1 page):** Describe your research interests, why you are a good fit, what motivates you, and what you hope to achieve in your PhD.
- **CV:** including projects and publications if any.
- **Academic transcripts:** Copies of certificates and transcripts from your Bachelor's/Master's
- **Two references:** Letters of recommendation if already available; otherwise provide names, affiliations, and email addresses of at least two referees.

Applications will be reviewed on a rolling basis until the position is filled. We recommend applying early. Incomplete applications or those sent as multiple files may not be considered.

Equal opportunity & accessibility

We are committed to promoting a culture of diversity and welcome applications from people regardless of gender, cultural background, nationality, ethnicity, sexual identity, physical abilities, religion or age. Applicants with severe disabilities will be given preference if equally qualified. If you need reasonable accommodations for any part of the process, tell us—no justification required.

Data protection

When you submit an application, we process your personal data under GDPR Art. 13 for the purpose of the application procedure. The relevant privacy notice can be found under https://portal.mytum.de/kompass/datenschutz/Bewerbung/.