



UNIVERSITÄT LEIPZIG

Reference number 325/2021

Postdoctoral position (m/f/d): Machine learning for understanding earth system processes

Founded in 1409, Leipzig University is one of Germany's largest universities and a leader in research and medical training. With around 30,000 students and more than 5000 members of staff across 14 faculties, it is at the heart of the vibrant and outward-looking city of Leipzig. Leipzig University offers an innovative and international working environment as well as an exciting range of career opportunities in research, teaching, knowledge and technology transfer, infrastructure and administration. Leipzig is a vibrant hotspot for creativity in central Germany, known for its world-class research in biodiversity, meteorology and remote sensing.

The **Remote Sensing Centre for Earth System Research** (<https://rsc4earth.de/>), Earth System Data Science group (led by Professor Mahecha) at the Faculty of Physics and Earth Sciences seeks to fill the above project position at the earliest opportunity.

Starting in 2022, the RSC4Earth will be a partner in the "ML4Earth center of excellence" led by the Technical University of Munich (TUM) Artificial Intelligence for Earth Observation (AI4EO) team. The project aims at tackling fundamental methodical challenges in AI4EO and their application to the European mission of a Digital Twin Earth. ML research directions will include physics-aware machine learning, reasoning, uncertainty estimation, explainable AI, sparse labels and transferability, as well as deep learning for complex structures. **In Leipzig, we will focus on explainable AI methods for detecting anomalies in high-dimensional earth system time series data.** Specifically, we aim to detect the signatures of climate extreme events in forest ecosystems and forecast their dynamics. Considering spatio-temporal context will be one of the challenges to address. The work benefits from close collaborations with our project partners, in particular with <https://ai4eo.de/>, Bonn University, the Alfred Wegener Institute, University of Bristol, and the German Aerospace Center as well as from our local partners (<https://scads.ai/>, <https://www.ufz.de/>) as well as from multiple international collaborations.

About the position

- Fixed term of 3 years
- 100 % of a full-time position
- Planned remuneration: Salary group E 13 TV-L

Duties

- Creativity for exploring unexpected avenues at the interface of earth and computer sciences.
- Research on adapting novel deep learning approaches to the specificities of earth system data, while respecting the system specific peculiarities.
- Exploration of "earth system data cubes" with explainable AI methods or causal inference, i.e. detection and explanation of anomalies in high-dimensional time series data.
- Particular focus on forest ecosystems and their spatio-temporal dynamics using both remote sensing and climate data.
- Presenting results at high-level conferences and publishing in high-level scientific journals.

Requirements

- Completed university degree in computer science or applied mathematics, remote sensing, geophysics, physics, or related areas.
- Ideally a completed PhD in one of the above areas.
- Expertise in computer vision and/or machine learning (deep learning) methods. Experience in handling geospatial and temporal earth system data.
- Needless to say that we expect fluency in one or more scientific programming languages such as Python, R, or Julia.
- Very good communication skills (oral and written) in English.
- Ability to work in a highly interdisciplinary group.

What we offer

- A modern workplace and attractive working conditions (mobile working)
- Flexible working hours and work-life balance
- Goal-oriented staff development throughout your working life, with opportunities for continuing professional development
- Pension plan
- Commuter pass for the MDV network

Specific questions should be addressed to Professor Miguel Mahecha (miguel.mahecha@unileipzig.de). Please send your application, **preferably by email as a single PDF file**, with the usual documents (CV, list of publications, certificates, motivation letter) quoting reference number 325/2021, **by 14 January 2022** to: dekan@physik.uni-leipzig.de or to Leipzig University, Dean of the Faculty of Physics and Earth Sciences, Professor Christoph Jacobi, Linnéstraße 5, 04103 Leipzig.

Please note that it is not possible to guarantee confidentiality and rule out unauthorised access by third parties when communicating by unencrypted email. We kindly request that you submit copies only, as we are unable to return application documents. Interview expenses will not be reimbursed.

Leipzig University aims to increase the proportion of women in positions of responsibility and therefore expressly invites qualified women to apply. Severely disabled persons – or persons deemed legally equal to them under Book IX of the German Social Code – are encouraged to apply and will be given preference in the case of equal suitability.

Privacy information

If you choose to apply and send us your documents, you do so voluntarily. Any personal data contained within your application documents, or obtained during an interview, will be processed by Leipzig University – as the advertiser of the position – exclusively for the purposes of the selection process for the position advertised. It will not be passed on to third parties without your consent in the individual case. The legal basis for such data processing is Sect. 11(1) of the Saxon Data Protection Implementation Act (SächsDSDG) in conjunction with the EU General Data Protection Regulation (GDPR). The controller for the application process within the meaning of the GDPR is the addressee of the application, specified in the advertisement. Your personal data will be stored for six months after the end of the recruitment process and then erased or destroyed in accordance with data protection regulations. You may refuse or withdraw your consent with effect for the future without giving reasons. In these cases, Leipzig University will not or no longer be able to process and consider your application. Under the GDPR, subject to the relevant statutory requirements you have the following rights vis-à-vis the addressee of the application with regard to your personal data: right of access (Art. 15 GDPR); right to rectification of inaccurate personal data (Art. 16 GDPR); right to erasure (Art. 17 GDPR); right to restriction of processing (Art. 18 GDPR); and right to object to processing (Art. 21 GDPR). If you have any questions, please contact the Data Protection Officer at Leipzig University (office: Augustusplatz 10, 04109 Leipzig). You also have the right to lodge a complaint with the Saxon Commissioner for Data Protection.