

The Leibniz Institute for Agricultural Engineering and Bioeconomy is a pioneer and a driver of bioeconomy research. We create the scientific foundation to transform agricultural, food, industrial, and energy systems into a comprehensive bio-based circular economy. We develop and integrate techniques, processes, and management strategies, effectively converging technologies to intelligently crosslink highly diverse bioeconomic production systems and to control them in a knowledge-based, adaptive, and largely automated manner. We conduct research in dialogue with society - knowledge-motivated and application-inspired.

The following position is to be filled for the three-year main phase of the joint project "**Innovative practices, tools and products to boost soil fertility and peat substitution in horticultural crops (SPIN-FERT)**", which is funded by the Horizon Europe call for sustainable soil management for a green future:

Scientist for the Doctorate (100 %) Focus on Artificial Intelligence

SPIN-FERT addresses the lack of understanding how soil health indicators, agricultural practices, and agricultural production affect each other over time in the different cropping systems across the EU. The implementation of the Soil Holistic Quality Index (SHQI) shall fill this gap, thus having a long-term impact on the application of soil-related policies. In the project, we aim for a comprehensive understanding of soil quality that integrates physical, chemical, biological, and climatic parameters by developing AI-based models to deliver a Soil Holistic Quality Index, useful for technical (farmers, advisors, manufacturers) and policy development applications.

Your task will be to reveal complex relationships of soil characteristics with microbial metabolism. The aim is to refine the predictions of soil quality based on physiochemical and functional analysis and achieve a holistic understanding of soil quality.

The position is assigned to ATB's Data Science in Bioeconomy Department in close collaboration with the Department of Microbiome Biotechnology. There are 19 inter-disciplinary external partners from Germany, Italy, Austria, Spain, France, UK, Netherlands, and Poland.

Your responsibilities

- Development of novel artificial intelligence methods
- Scientific processing of projects, especially with a focus on:
 - Regression analysis
 - Image classification, object detection, and segmentation
 - Explainable Artificial Intelligence
- Analysis of multimodal data, e.g., hyperspectral images of crops, soil physical-chemical properties and microbial metabolic and genetic data
- Communication and transfer of the project findings to the project partners
- Presentation of project findings at conferences and workshops
- Creation of project reports and scientific publications

Your qualifications

- Successfully completed university degree (master, diploma, or equivalent) in computer science, physics, engineering, mathematics, or comparable field
- Profound knowledge in the field of machine learning, in particular deep neural networks
- Practical experience in the application of machine learning algorithms for both regression and classification problems
- Profound knowledge of computer vision, especially segmentation and object recognition

- Knowledge in the field of explainable artificial intelligence is an advantage
- Basic knowledge of the environment, agriculture, microbiome, and biodiversity is an advantage
- Sound programming skills (especially in Python), experience with ML and linear algebra libraries (PyTorch, Tensorflow, NumPy, scikit-learn, etc.)
- Experience in using versioning tools, e.g. Git
- Experience with Unix-based systems, e.g. Linux
- Excellent written and spoken English skills
- Experience in scientific work is beneficial
- Flexibility, creativity, willingness to cooperate, and excellent communication skills
- High sense of responsibility, reliability, personal commitment, and goal-oriented and independent work

We offer

- Exciting research tasks in the field of machine learning with highly socially relevant fields of application
- The opportunity to make valuable contributions to cutting-edge AI research
- The opportunity to publish your papers in conference and journal publications
- The possibility of a doctorate (PhD)
- The opportunity to gain interdisciplinary knowledge from experts in diverse research areas
- A highly motivated, international team
- Flexible working hours and excellent equipment
- Supervision by experienced scientists
- Family-friendly working conditions that promote the compatibility of work and family life
- Close cooperation with the Berlin Institute for the Foundations of Learning and Data (BIFOLD), the research group Machine Learning of the HHI and the Institute of Computer Science of the University of Potsdam, the research group UMI lab, and many others
- Participation on the VBB company ticket or Deutschland ticket
- An easily accessible work place (bike, public transport) on the edge of a park-like landscape

About the position

The position is expected to be filled from 1st October 2024 for a limited period of three years in accordance with the project duration. The salary is dependent on your qualifications and professional experience up to pay group 13 TV-L.

About the application process

For further information please contact **Prof. Dr. Marina Höhne** (E-Mail: MHoehne@atb-potsdam.de) and visit our website www.atb-potsdam.de.

If you would like to contribute your expertise to our interdisciplinary research please apply by **August 25, 2024** using ATB's online application form for the job advertisement, reference code **2024-DS-2** at <https://www.atb-potsdam.de/en/career/vacancies>.

Equality of opportunity is part of our personnel policy. Disabled applicants with adequate qualifications will be preferentially considered.

By submitting an application, you agree that your job application documents will be stored for a period of six months, even in the case of an unsuccessful application. Further information on the processing, storage and protection of your personal data can be found at <https://www.atb-potsdam.de/en/data-protection-declaration-for-the-application-process>.

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