Are you interested in pursuing a research project in data science using AI on state-of-the-art supercomputers? Our labs, "Applied Machine Learning" and "AI and Machine Learning for Remote Sensing", are seeking applicants for a joint PhD student position at the Jülich Supercomputing Centre (JSC) focusing on learning versatile embeddings in the field of remote sensing. At JSC, we operate one of Europe’s most powerful High Performance Computing (HPC) systems for scientific and engineering applications. Our labs are deeply engaged in developing parallel Machine Learning (ML) methods that can be scaled on HPC, as these systems offer a robust solution for a data-intensive application that require vast data storage and high processing capabilities.

We are offering a

**PhD position - Learning Embeddings for Earth Observation Applications with Supercomputing**

**Your Job:**
The quality and quantity of Earth Observation (EO) data is increasing at a high rate. However its volume makes handing the data challenging, especially as the bandwidths between data centers do not grow accordingly. In your PhD, you will develop AI methods to enhance the accessibility and analysis of a vast amount of high-resolution, multi-source EO data. You will research ML methods of encode and compress high-volume EO data into practical, much smaller representations and scale them to large datasets on our supercomputers. These techniques are designed to efficiently exchange massive geospatial data for few-shots learning, and facilitating real-time searchers on petabyte-scale data. This research will take place within the scope of the recently funded EU project, Embed2Scale.

The main tasks of your PhD project:
- Analyze selected EO applications using multi-source remote sensing data
Develop, implement, and refine ML techniques
Implement parallel ML training on supercomputers
Engage with national and international ML and EO communities
Present research findings at scientific meetings, conferences, and in scientific papers
Contribute to educational events, including courses and hackathons

Your Profile:
Excellent Master`s degree in Computer Science, Data Science, Mathematics, Physics or similar fields
Strong knowledge of AI, applied ML- and Deep Learning workflows and prevalent software libraries
A keen interest in applying your data science expertise to satellite data
Hands-on experience with High-Performance Computing Systems, parallel/distributed programming and/or robust UNIX skills
A high level of academic achievement as demonstrated by bachelor`s and master`s study transcripts, and supported by two reference letters
Proficiency in programming with at least one of the following: Python, C, C++
Excellent communication skills in English
Outstanding cooperation and communication abilities, coupled with the skill to collaborate as part of a scientific team in an international and interdisciplinary setting
Your expertise should be showcased in research papers and open-source code projects

Our Offer:
We work on the very latest issues that impact our society and are offering you the chance to actively help in shaping the change! We offer ideal conditions for you to complete your doctoral degree:
You will be employed at the Jülich Supercomputing Centre and enrolled at the Faculty of Industrial Engineering, Mechanical Engineering and Computer Science (University of Iceland, Reykjavik, Iceland):
https://english.hi.is/faculty_of_industrial_engineering_mechanical_engineering_and_computer_science
Outstanding scientific and technical infrastructure - ideal conditions for successfully completing a doctoral degree
Highly motivated researchers as well as an international and interdisciplinary working environment at one of Europe`s largest research establishments
Continuous scientific mentoring by your scientific advisors
The opportunity to be part of Embed2Scale, a project funded by Horizon Europe Framework Programme (HORIZON) with 10 academic and industry partners from all over Europe
Access to advanced supercomputers, in particular Modular Supersomputing Architectue (MSA) environments
Chance of participation in (international) top conferences in the field of ML, HPC, and remote sensing
30 days of annual leave and provision for days off between public holidays and weekends (e.g. between Christmas and New Year)
Further development of your personal strengths, e.g. through an extensive range of training courses; a structured program of continuing education and networking opportunities specifically for doctoral researchers via JuDocS, the Jülich Center for Doctoral Researchers and Supervisors: https://www.fz-juelich.de/en/judocs

The position is initially for a fixed term of 3 years, with possible long-term prospects. Pay
in line with 75% of pay group 13 of the Collective Agreement for the Public Service (TVöD-Bund) and additionally 60% of a monthly salary as special payment („Christmas bonus“). Further information on doctoral degrees at Forschungszentrum Jülich including our other locations is available at: https://www.fz-juelich.de/gp/Careers_Docs

We welcome applications from people with diverse backgrounds, e.g. in terms of age, gender, disability, sexual orientation / identity, and social, ethnic and religious origin. A diverse and inclusive working environment with equal opportunities in which everyone can realize their potential is important to us.