Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

AI RESEARCH SOFTWARE ENGINEER FOR REAL TIME APPLICATIONS IN PARTICLE PHYSICS

Institution: Faculty of Mathematics, Informatics and Natural Sciences, Department of Physics, Institute of Experimental Physics
Salary level: EGR. 13 TV-L
Start date: 01.06.2025, permanent
Application deadline: 2025-04-01
Scope of work: full-time position suitable for part-time

The experiments at the Large-Hadron-Collider (LHC) require multi-step algorithms to reduce the initial data rate from 40 MHz by several orders of magnitude for offline storage. The first step of these algorithms operates on dedicated FPGA (field programmable gate array) hardware. Given the crucial nature of this initial selection step, traditional rule-based selection approaches are now increasingly replaced with machine learning and artificial intelligence (AI) algorithms. To further strengthen the CMS group at the University of Hamburg, we are looking for a research software engineer, focusing on FPGA-based applications for current and future experiments in particle physics.

The CMS group of the University of Hamburg hosts more than 60 researchers, technicians, and administrative personnel and is engaged in a broad program of physics analysis – including measurements of the Higgs boson and the top quark as well as searches for new phenomena beyond the standard model – as well as the planning and constructions of future experiments. A major focus lies on the development and application of modern AI techniques.

We are part of the cluster of excellence Quantum Universe which connects researchers at the University of Hamburg and DESY and which hosts a dedicated Fast Machine Learning Lab for shared expertise on real-time applications of AI.

Responsibilities

- contributions to the development of the trigger and data acquisition system of the CMS experiment and other ongoing and future experiments
- work on the development and adaptation of algorithms - especially AI methods - for real-time applications
- preparation, operation and maintenance of systems (e.g. FPGA boards and environments) for the study of real-time algorithms
- contributions to data acquisition from particle physics experiments

Requirements

- a completed university degree (Master's degree or equivalent) in computer science or physics or a comparable field of study

or

- equivalent skills, experience, and qualifications

Verification of equivalent skills, experience, and qualifications for the last prerequisites will be conducted on hiring.

Required skills and personal qualities

- relevant experience in software development
- knowledge and experience in the development, application and deployment of AI algorithms in real-time environments
- experience in the application/operation of FPGA and similar systems
- good written and spoken German or English
- expertise in particle physics is desirable, but not a prerequisite
- strong ability to work in a team and willingness to cooperate
- quick comprehension, initiative and commitment
- structured and independent way of working

We offer


Reliable remuneration based on wage agreements


Continuing education opportunities


University pensions


Attractive location


Flexible working hours


Work-life balance opportunities


Health management, EGYM Wellpass


Employee laptops


Mobile work


Educational leave


30 days of vacation per annum

Universität Hamburg—University of Excellence is one of the strongest research educational institutions in Germany. Our work in research, teaching, educational and knowledge exchange activities is fostering the next generation of responsible global citizens ready to tackle the global challenges facing us. Our guiding principle “Innovating and Cooperating for a Sustainable Future in a digital age” drives collaboration with academic and nonacademic partner institutions in the Hamburg Metropolitan Region and around the world. We would like to invite you to be part of our community to work with us in creating sustainable and digital change for a dynamic and pluralist society.

The Free and Hanseatic City of Hamburg promotes equal opportunity. As women are currently underrepresented at this salary level at University of Hamburg according to the evaluation conducted under the Hamburg act on gender equality (Hamburgisches Gleichstellungsgesetz, HambGleiG), we encourage women to apply for this position. Equally qualified and suitable female applicants will receive preference.

We explicitly encourage persons with an immigrant background to apply.

Severely disabled and disabled applicants with the same status will receive preference over equally qualified non-disabled applicants.

Instructions for applying

Contact

Prof. Dr. Gregor Kasieczka
gregor.kasieczka@uni-hamburg.de

Location

Luruper Chaussee 149
22761 Hamburg
Zu Google Maps

Reference number

606/4

Application deadline

2025-04-01

Use only the online application form to submit your application with the following documents:

- Cover letter
- CV: Please indicate at least two references (name, e-mail and relation to your work) in your CV. Note that no letters of reference are required at this point.
- copies of degree certificate(s)

If you experience technical problems, send an email to bewerbungen@uni-hamburg.de.
More information on data protection in selection procedures.