

2018 HGF – GSI – OCPC – Programme

For the involvement of postdocs in bilateral collaboration projects

Part A:
Title of the project:
Machine Learning Algorithms for PANDA Software Trigger
Helmholtz Centre and institute:
GSI Helmholtz Center for Heavy Ion Research GmbH
Project leader:
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Description of the project :
<p>The PANDA experiment at FAIR in Darmstadt, Germany, will study anti-proton induced reactions in the charmonium energy region with unprecedented energy resolution and luminosity.</p> <p>One major challenge is to find the interesting particle reactions among the very large number of up to 20 million generic events per second. For that purpose, an intelligent online-event-filtering technique has to be implemented being able to reduce the data stream by several orders of magnitude while keeping the interesting physics with a high efficiency.</p> <p>It will be based on the idea that interesting events (e.g. comprising charmonium or open charm resonances) differ from light-hadronic (background) events in kinematic distributions, multiplicities or event shapes. These quantities need to be reconstructed and computed</p>

during data acquisitions and thus can be used as input for filtering algorithms. A proof-of-principle study with a cut-and-count algorithm set to trigger all kinds of interesting event signatures has already been carried out.

In order to optimize the performance of such a triggering scheme in terms of signal efficiencies as well as minimal computing demand, the candidate will be involved in developing machine learning and multi-variate analysis strategies for that purpose. In addition, she/he has the opportunity to evaluate different hardware systems for the implementation of the triggering algorithm scheme.

Description of existing or sought Chinese collaboration partner institute:

- MP Lanzhou, USTC Hefei, Nankai U and IHEP Beijing are members of PANDA
- GSI is a member of the BES3 Experiment since 2006 at IHEP, Beijing
- Close contact to SICCAS in Shanghai for crystal calorimeter development

Required qualification of the post-doc:

- PhD in Physics or Computer Sciences
- Experience with C++ programming, ROOT analysis framework
- Language requirement: English

Part B:

Documents to be provided by the post-doc:

- Detailed description of the interest in joining the project (motivation letter)
- Curriculum vitae (CV)
- copies of degrees as a proof of education qualification
- List of publications (if any)
- 2 letters of recommendation

Part C:

Additional requirements to be fulfilled by the post-doc:

- Very good command of the English language
- Strong ability to work independently and in a team