2020 HGF – OCPC – Programme
for the involvement of postdocs in bilateral collaboration projects

Title of the project:

Machine Learning based reconstruction for future higgs factories

Helmholtz Centre, division/group:

DESY

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Description of the project (max. 1 page)**:**

DESY is one of the world's leading research centres for photon science, particle and astroparticle physics as well as accelerator physics. More than 2400 employees work at our two locations Hamburg and Zeuthen in science, technology and administration. The FLC group at DESY in Hamburg has been a leading player in the preparation of a detector for a future Higgs factory. The group activities range from detector R&D and detector integration over to physics analyses and software development. In particular, has the group been the major driver for the development of the software ecosystem iLCSoft that has been used for detector design and optimization at all four envisaged future Higgs factories ILC, CLIC, FCC-ee and CEPC. Recently these four groups have decided to strengthen the common software development through a joint project called Key4hep.
In this context, we seek a talented and highly motivated post doc to work on the development of state of the art software tools for simulation, reconstruction and analysis for future Higgs factories. Specifically, we would like to focus in this project on the application of machine learning algorithms to event reconstruction and analysis, ranging from charged particle track reconstruction over particle flow based clustering in the highly granular calorimeters to flavour tagging and jet clustering. The algorithms will ideally be developed in a detector agnostic way, such that they can be equally well applied to the different flavours of detectors currently envisaged for the future Higgs factories. An essential part of the project will be the benchmarking of the novel machine learning based methods

against the current state-of-the-art algorithms.

Description of existing or sought Chinese collaboration partner institute (max. half page)**:**

Any institute that is involved in physics and detector studies for the CEPC.

Required qualification of the post-doc:

- PhD in particle physics
- Strong background in computing for HEP in C++ and Python
- Fluent in English with good communication skills
- Ideally, experience with Machine Learning Methods
- Ideally, familiarity with the CEPC detector and physics studies