

**PhD position**

University of Bern  
Switzerland

**Online event selection using machine learning techniques with the ATLAS experiment**

The ATLAS experiment at CERN's Large Hadron Collider is taking proton-proton collision data and is facing harsher and harsher conditions to keep up with its efficient operation under more stringent conditions, when LHC is being upgraded to HL-LHC, its high-luminosity version. At the collision point in the center of the ATLAS experiment, bunches of protons are colliding head on, leading to multiple proton-proton collisions being overlaid with every bunch crossing. With HL-LHC, 140 collisions, up from 40 collisions at present, will happen at every 25 ns interval, leading to pile-up of data in the ATLAS detector. Pile-up is making it harder to identify signatures that particles leave in the detector and thus particle identification will be harder to achieve. To keep online filtering within the targeted signal efficiency, processing latency and readout output rate, machine learning techniques may offer unprecedented solutions.

**Job description**

The successful candidate will become member of the ATLAS collaboration and will be involved in exploiting machine learning techniques for energy reconstruction and trigger selection based on calorimetry and tracking information. Using advanced computational intelligence models, a significant improvement of the online triggering efficiency is expected, which will be of high value in the search for rare events that enable new insight in the understanding of the Standard Model and in searches for new physics beyond the Standard Model.

**Requirements**

You are a highly skilled and enthusiastic researcher who enjoys working in the vibrant environment that large international collaborations offer. You should hold a master's degree, have a strong interest in machine-learning techniques processing mass-amount of data in a time-critical environment, and be strongly interested in high energy physics experiments. You are a team-oriented and communicative person and act independently, show initiative and are driven to find solutions of which you will show that these perform within expectations. Good knowledge of English (written and oral) is mandatory. Your work place will be CERN and you will also be spending time at the Rio de Janeiro State University, who is a close partner in this project.

**Application:**

Candidates are requested to send a short letter of motivation, their CV, and names and contact information of references to the email address given below. The review of applications will continue until the position is filled.

For further information, please contact:

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