| Scientific supervisor | |
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| Name | Marcin Misiaszek |
| E-mail | marcin.misiaszek@uj.edu.pl |
| Department | Department of Experimental Computer Physics |
| Laboratory | MLP Lab - Machine Learning for Physics |
| Group webpage | |

**Proposed research topic**

*Application of HPC (High Performance Computing) methods for data analysis from neutrino experiments.*

**Short description (< 1000 characters)**

The software group from the Department participates in the analysis of unique data from the Borexino and GERDA neutrino experiments. Modern methods of data analysis use algorithms based on machine learning and High Performance Computing systems (HPC) are used during their execution. During the practice, the student will have the opportunity to undertake one of the current issues as part of collaborative work. The student will be able to use the computing power available in PL-GRID to perform massive Monte Carlo simulations or make attempts to optimize filters based on neural network algorithms. Employing the ARES supercomputer, we will perform Monte Carlo simulations on a huge scale, not present so far in the course of data analysis in the above neutrino experiments. During the student internship, we will try to use HPC methods in order to increase the experimental sensitivity and possible discoveries in the future. The student will be introduced to the application of Singularity, the main goal of which is to introduce the use of containers and preservation of reproducibility to large-scale scientific computing.

**Main research tool**

ARES server in PL-GRID. Singularity software package.

**Additional requirements to the candidate**

- basics of Linux and python

**Possibility to continue student internship in the form of:**

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| Diploma thesis (master's or bachelor's degree) | X |
| PhD study | X |