

**Seminarium Studium Doktoranckiego NCBJ**

**Thursday, 15 April, 9:00**

<https://www.gotomeet.me/NCBJmeetings/phd-seminar>

**Speaker:**

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**Title:**

New Software Technologies at the LHCb Experiment

**Abstract:**

The LHCb Experiment is one of the largest detectors located at the Large Hadron Collider (LHC) at CERN (The European Organization for Nuclear Research). With the data collected during LHC Run 1 and Run 2, the LHCb Experiment has successfully performed a large number of measurements in heavy flavour physics. In order to perform further measurements with higher precision, the LHCb Experiment is currently installing a major detector upgrade for Run 3 of data taking so that it will be able to process events with 5 times higher luminosity. It is also planning a further upgrade with another increase in luminosity by a factor of 5 to 10. Higher capacity in data storage, computing power, and data processing is needed to prepare the experiment for the changes in Run 3. The whole software of the experiment is being adapted to work in a multithreaded environment in order to exploit as many as possible of the available computing resources. Moreover, new software technologies have to be introduced in order to produce a sufficient number of Monte Carlo samples. In this talk, I am going to present recent investigations on how to integrate deep learning-based fast simulation techniques in the LHCb Gauss simulation framework and a new approach to cluster reconstruction in the electromagnetic calorimeter using convolutional neural networks.