

Calorimeter reconstruction with computer vision at LHCb

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LHCb is a single-arm forward spectrometer designed to study b-physics at the LHC. As the beam luminosity will increase in the upcoming years, new challenges are expected in reconstructing high density events. The electromagnetic calorimeter in particular will be subject to much larger occupancy and the overlap of showers is expected to drastically limit reconstruction efficiency with current methods. In this project we explore the potential for novel techniques in computer vision to improve reconstruction of EM showers in the LHCb detector. In the current starting phase of the project we are exploring simple solutions using CNNs, but we anticipate the non-uniform geometry of the LHCb calorimeter may pose problems given the translation invariance inductive bias of CNNs. Dealing with this issue may require more sophisticated models including Graph NNs and super-resolution techniques. In this talk I will give an overview of the motivation and status of the project.

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Classification de thématique: ML for data reduction : Application of Machine Learning to data reduction, reconstruction, building/tagging of intermediate object