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Studies on track finding algorithms based on machine learning with GPU and FPGA

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Track finding in high-density environments is a key challenge for experiments at modern accelerators. In this presentation we describe the performance obtained running machine learning models studied for the ATLAS Muon High Level Trigger. These models are designed for hit position reconstruction and track pattern recognition with a tracking detector, on a commercially available Xilinx FPGA: Alveo U50, Alveo U250, and Versal VCK5000. We compare the inference times obtained on a CPU, on a GPU and on the FPGA cards. These tests are done using TensorFlow libraries as well as the TensorRT framework, and software frameworks for AI-based applications acceleration. The inference times obtained are compared to the needs of present and future experiments at LHC.

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