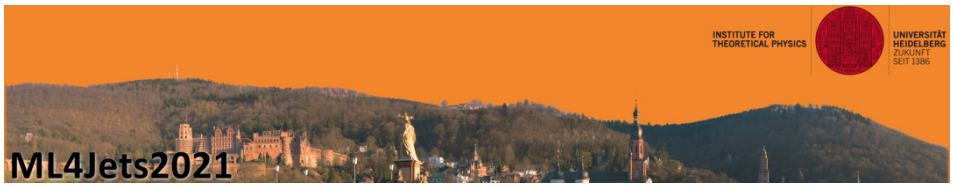

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Lightweight Jet Reconstruction as an Object Detection Task

Wednesday, 7 July 2021 15:40 (20 minutes)

We apply object detection techniques based on convolutional blocks to jet reconstruction and identification at the CERN Large Hadron Collider. We use particles reconstructed through a Particle Flow algorithm to represent each event as an image composed of a calorimeter and tracker cells as input and a Single Shot Detection network, called PFJet-SSD. The network performs simultaneous localization, classification and auxiliary regression tasks to measure jet features. We investigate Ternary Weight Networks with weights quantized to {-1, 0, 1} set, times a layer- and channel-dependent scaling factors for reducing memory and latency constraints. We show that the quantized version of the network closely matches the performance of its full-precision equivalent while both outperform the physics baseline. Finally, we report the inference latency on Nvidia Tesla T4.

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Session Classification: Regression, Calibration, and Fast Inference