Contribution ID: **743**   Type: **Parallel session talk**

Machine Learning for Real-Time Processing of ATLAS Liquid Argon Calorimeter Signals with FPGAs

Friday 19 July 2024 11:53 (17 minutes)

New readout electronics for the ATLAS LAr Calorimeters are being developed, within the framework of the experimental upgrades for the HL-LHC, to be able to operate with a pile-up of up to 200 simultaneous pp interactions. Moreover, the calorimeter signals of up to 25 subsequent collisions are overlapping, which increases the difficulty of energy reconstruction. The energy computation will be performed in real-time using dedicated electronic boards based on FPGAs. To cope with the signal pile-up, new machine learning approaches are explored: convolutional and recurrent neural networks outperform the optimal signal filter currently used in energy resolution for energy reconstruction happening each bunch crossing. Very good agreement between neural network implementations in FPGA and software calculations is observed. The FPGA resource usage, the latency and the operation frequency are analysed. Latest performance results and experience with prototype implementations will be reported.

Alternate track

I read the instructions above

Yes

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