ML4FGPA

A real-time event filter based on physics signatures.

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Project scope

- An FPGA-based Neural Network application would offer online event preprocessing and allow for data reduction based on physics at the early stage of data pipeline.

- The ML-on-FPGA solution complements the purely computer-based solution and mitigates DAQ performance risks.

- FPGA provides extremely low-latency neural-network inference.

- Open-source HLS4ML software tool with Xilinx® Vivado® High Level Synthesis (HLS) accelerates machine learning neural network algorithm development.

- **The ultimate goal is to build a real-time event filter based on physics signatures.**

article: J. Duarte *et al* 2018 *JINST* **13** P07027
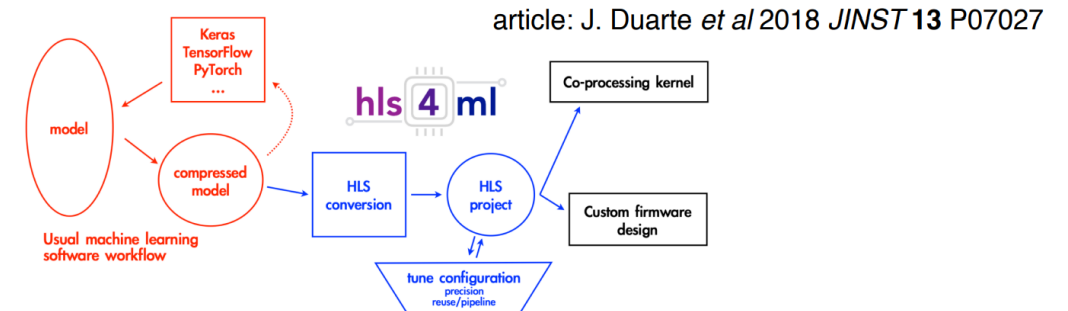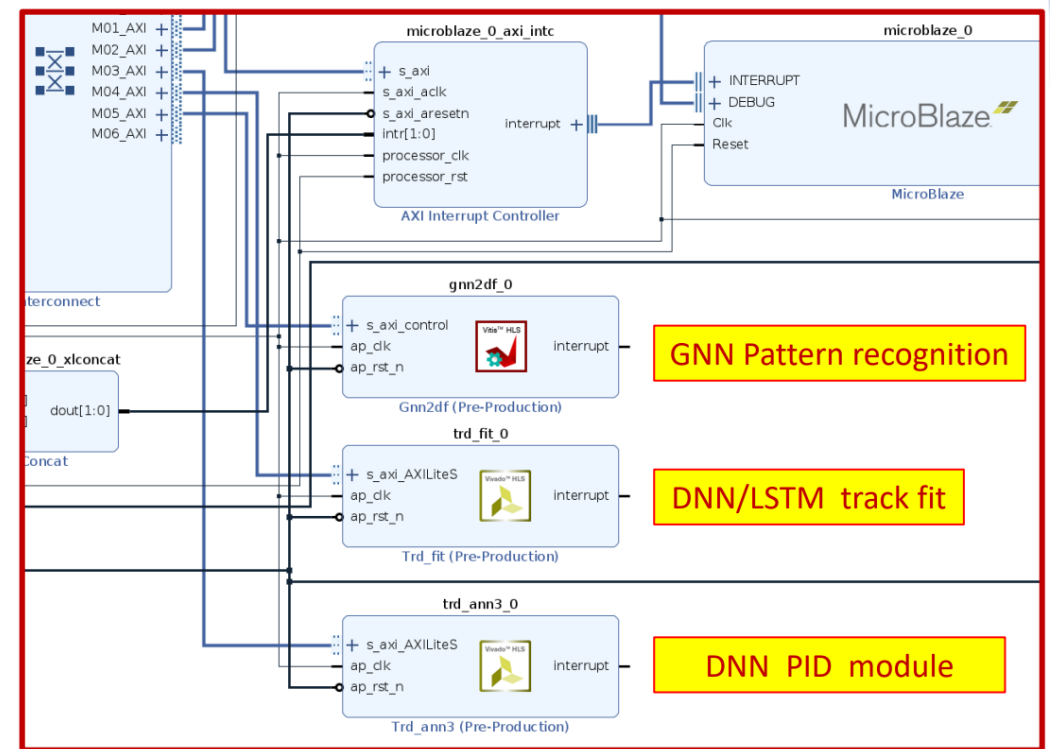
ML4FPGA – JANA4ML4FGPA

- Funded by EIC detector R&D
- Currently have hardware and software R&D setup
- Applied different Neural Network types for different tasks
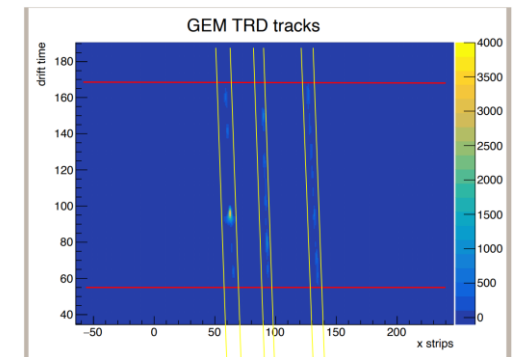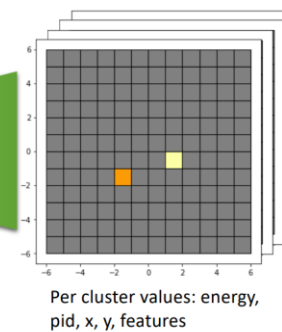- Jlab tests winter/spring 2023
- Fermilab tests 2023
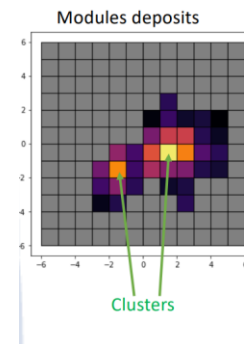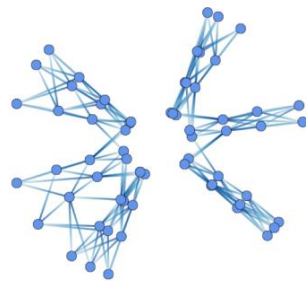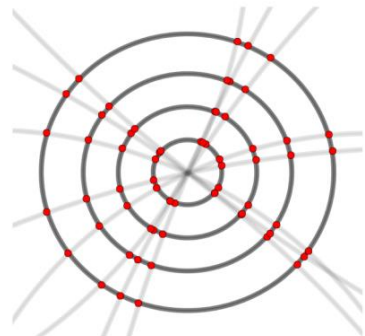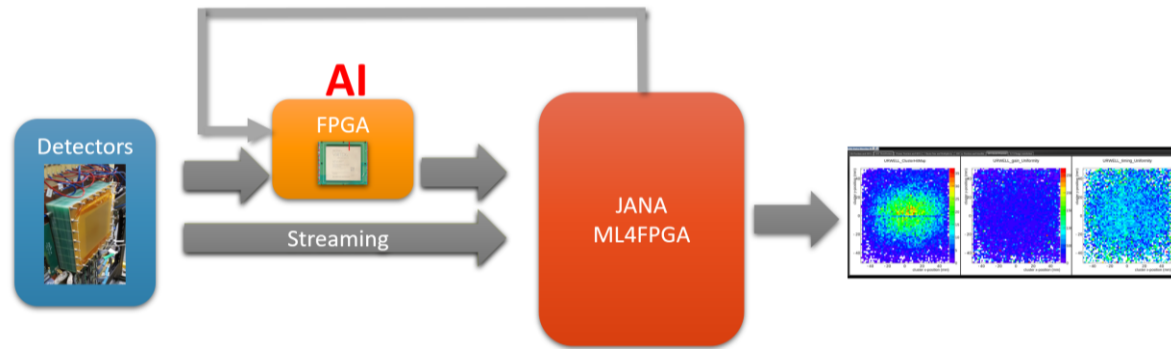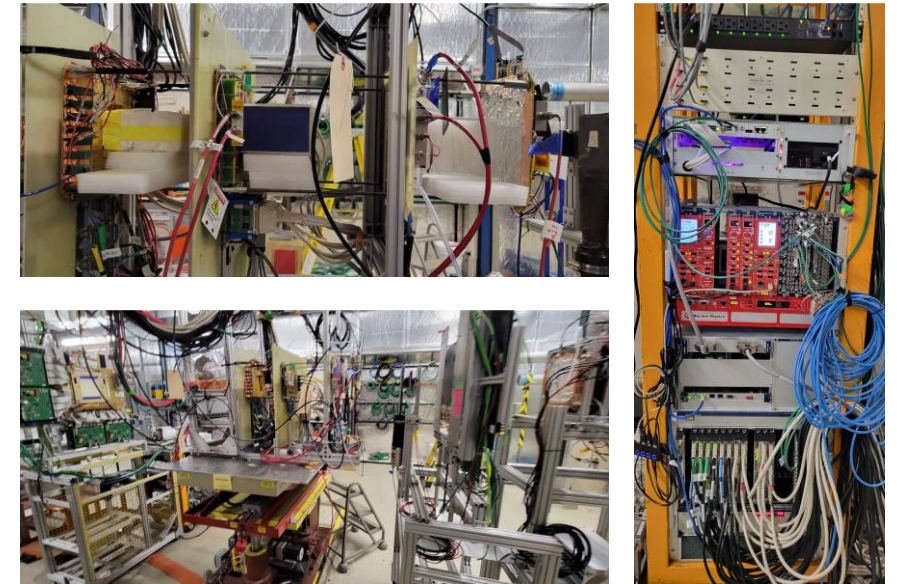
Javier Duarte arXiv:2012.01249v2 [hep-ph] 7 Dec 2020

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