Contribution ID: **1045**   Type: **Parallel session talk**

Applications of Lipschitz monotonic neural networks to the LHCb Run 3 trigger system

Friday 19 July 2024 14:30 (17 minutes)

The Run 3 data-taking conditions pose unprecedented challenges for the DAQ systems of the LHCb experiment at the LHC. Consequently, the LHCb collaboration is pioneering a fully software trigger to cope with the expected increase in event rate. The upgraded trigger has required advances in hardware architectures, expert systems and machine learning solutions. Among the latter, LHCb has explored the adoption of Lipschitz monotonic neural networks (NNs) to enact trigger decisions. Such architectures are appealing owing to their robustness under varying detector conditions and capacity to certify domain-specific inductive biases. This contribution presents the application of Lipschitz monotonic NNs within the LHCb Run 3 trigger. Emphasis is placed on the topological triggers, devoted to inclusively selecting b-hadron candidates, where Lipschitz NNs enable retention of the beauty candidates whilst enhancing sensitivity to feebly interacting BSM states produced within the LHCb acceptance.

Alternate track

1. Operation, Performance and Upgrade (incl. HL-LHC) of Present Detectors

I read the instructions above

Yes

Author: DELANEY, Blaise Raheem (Massachusetts Inst. of Technology (US))

Co-authors: CIEZAREK, Gregory (CERN); WILLIAMS, J Michael (Massachusetts Inst. of Technology (US)); AL-BRECHT, Johannes (Technische Universitaet Dortmund (DE)); SCHULTE, Nicole (Technische Universitaet Dortmund (DE))

Presenter: DELANEY, Blaise Raheem (Massachusetts Inst. of Technology (US))

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