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Advanced machine-learning solutions in LHCb operations and data analysis

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The LHCb detector is a forward spectrometer optimized for the reconstruction of charm- and bottom-hadron decays in LHC's proton-proton collisions.

The need to process large amounts of data within the constraints of the data-acquisition and offline-computing resources

pushes steadily toward usage of advanced data-analysis techniques. Currently, LHCb takes data at rates significantly higher than the design values, thanks also to purpose-developed machine-learning (ML) solutions. Such solutions are applied to an increasing class of essential online and offline tasks, including more precise and faster real-time classification of interesting events, smarter detector-performance calibrations, and more precise, efficient, and unbiased offline characterization of reconstructed events.

This talk overviews recent original ML applications in the trigger, operations, and analysis of LHCb data in 2015-2016 and discusses ongoing and future developments.

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Session Classification: Computing, Analysis Tools, and Data Handling

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