



Contribution ID: 762 Contribution code: **contribution ID 762**

Type: **Poster**

Machine Learning applications for Data Quality Monitoring and Data Certification within CMS

As the CMS detector is getting ready for data-taking in 2021 and beyond, the detector is expected to deliver an ever-increasing amount of data. To ensure that the data recorded from the detector has the best quality possible for physics analyses, CMS Collaboration has dedicated Data Quality Monitoring (DQM) and Data Certification (DC) working groups. These working groups are made of human shifters and experts who carefully investigate thousands of histograms generated from different parts of the detector. However, the current workflow is not granular enough and prone to human error and fatigue. On the other hand, several techniques in machine learning are designed to learn from large collections of data and make predictions for the data at an unprecedented speed. Hence, the data certification problem can be considered as a perfect problem for machine learning techniques to tackle. With the help of machine learning, we can increase the granularity and speed of the DQM workflow and assist human shifters and experts in detecting anomalies during data-taking. In this presentation, we will present preliminary results on incorporating machine learning to highly granular DQM information for data certification. We will also discuss the challenges and integration into the human-centric certification process.

Significance

References

Speaker time zone

Compatible with Asia

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Session Classification: Posters: Windmill

Track Classification: Track 2: Data Analysis - Algorithms and Tools