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Latest developements in the CATHODE anomaly detection method

The Standard Model of particle physics has been successful in describing fundamental particles and their interactions, yet it fails to explain concepts like dark matter or the hierarchy problem, motivating the search for physics beyond the Standard Model. Despite an extensive search program at the LHC, no hints for new physics have been found so far. Anomaly detection has been introduced as a bridge between generic searches and searches targeting a specific signal. CATHODE (Classifying Anomalies THrough Outer Density Estimation) is a two-step anomaly detection method that first uses a generative model to produce an in-situ estimate of the background and subsequently isolates signal-like events with a classifier.
We present the most recent developments to CATHODE, improving its reliability and versatility in uncovering potential new physics signals.

AI keywords

anomaly detection; generative models; Cathode

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Track Classification: Patterns & Anomalies