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# Anomaly Detection in the ATLAS Trigger System

The application of machine learning techniques in particle physics has accelerated the development of methodologies for exploring physics beyond the Standard Model. This talk will present an overview of anomaly detection, an unsupervised machine learning technique, and its potential to enhance the detection of new physics within data collected by the ATLAS detector at CERN. The talk will discuss the adaptation and real-time deployment of anomaly detection algorithms, integrated into the detector's trigger system. Additionally, a novel analysis strategy will be outlined for detecting non-resonant anomalies in a model - agnostic manner, utilizing autoencoders, which are based on deep neural networks. The presentation will include signal sensitivity studies for anomalous events, along with background estimation studies, based on the performance of the autoencoders.

## Secondary track

T09 - Beyond the Standard Model

**Author:** SAHA, Shreya (University of Adelaide)

**Session Classification:** Joint T12+T16

**Track Classification:** T16 - AI for HEP (special topic 2025)