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Robust Anomaly Detection in the Presence of Irrelevant Features

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Recent data-driven anomaly detection methods, such as CWoLA and ANODE, have shown promising results. However, they all suffer from performance degradation when irrelevant features are included. We demonstrate how these methods can be made robust even when the dataset is dominated by irrelevant features. The key idea is to employ Boosted Decision Tree (BDT)-based algorithms for signal/background discrimination and/or probability density estimation. This approach provides a natural measure of feature relevance, and can aid in constructing more interpretable models. Another advantage is that training the BDT algorithm requires significantly less computational resources than the earlier neural-network based approaches to this problem.

Authors: FREYTSIS, Marat; Prof. PERELSTEIN, Maxim (Cornell University); SAN, Yik Chuen

Presenter: SAN, Yik Chuen

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