

Speaker: Zhou Wang

Title: Latent Outlier Exposure for Anomaly Detection with Contaminated Data

Abstract: Anomaly detection aims at identifying data points that show systematic deviations from the majority of data in an unlabeled dataset. A common assumption is that clean training data (free of anomalies) is available, which is often violated in practice. The authors propose a strategy for training an anomaly detector in the presence of unlabeled anomalies that is compatible with a broad class of models. The idea is to jointly infer binary labels to each datum (normal vs. anomalous) while updating the model parameters. Inspired by outlier exposure (Hendrycks et al., 2018) that considers synthetically created, labeled anomalies, this paper's authors thereby use a combination of two losses that share parameters: one for the normal and one for the anomalous data. They then iteratively proceed with block coordinate updates on the parameters and the most likely (latent) labels. Their experiments with several backbone models on three image datasets, 30 tabular data sets, and a video anomaly detection benchmark showed consistent and significant improvements over the baselines.

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