Abstract

Anomalies are patterns that lack normal behavior. Anomaly detection process can be used to predict changes in input patterns and can prevent different malicious activities. Kernel Principal Component Analysis is an effective, anomaly detection technique. This is an effective technique for non-linear data set. In this, kernel Eigenspace splitting and merging approach is used for predicting the anomalies effectively. Kernel splitting process, can extract smaller KES from larger KES. Here a QR decomposition technique can be used for, KES splitting. This is done to remove the data patterns that no longer fit to the current data distribution. KES splitting is combined with KES update. An adaptive update takes an appropriate sliding window size into consideration and reduces the number of updates required, when a change in the data distribution occurs. Thus an adaptive split-merge KES with QR decomposition, shows a superior performance in predicting anomalies that have a non-linear behavior.

References
A QR Decomposition Approach for Improved Anomaly Detection over Non-linear Data

3. Jiawei Han, Micheline Kamber and Jian Pei, "Data Mining: Concepts and Techniques", 2nd ed. Morgan Kaufmann, 2006.

Index Terms

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