



PRE-PROCESSING FOR ENHANCED ANOMALY DETECTION ON PERIODIC SERVER FARM TELEMETRY DATA

Dániel László Vajda, Károly Farkas

Department of Networked Systems and Services, Faculty of Electrical Engineering and Informatics, Budapest University of Technology and Economics, Műegyetem rkp. 3., H-1111 Budapest, Hungary
e-mail: dvajda@hit.bme.hu

ABSTRACT

With increased network infrastructure complexity on all levels, telemetry has become instrumental in maintaining desired operations within server farms. No matter the application, operators and users benefit significantly from the continuous telemetry of interconnected networking devices. Once data collection to an operations centre is achieved, anomaly detection is an essential step in the monitoring process: an algorithm aims to identify and raise alerts for signs of abnormal behaviour, helping increase maintenance efficiency and decrease downtimes. However, we identified challenges that some modern approaches face with periodic datasets, causing performance degradation. As a solution, we present a novel pre-processing procedure to improve anomaly detection in the telemetry of server farms. Our procedure removes signals with regular patterns (termed modes) from the incoming data using a mathematically well-grounded transformation algorithm while preserving signs of anomalies in the data that remain. We performed experiments measuring the improvement of our pre-processing procedure to our latest and other state-of-the-art anomaly detection algorithms using the well-established F-score metric. As expected, we achieved significant improvement in the case of our latest anomaly detection algorithm when experimenting with periodic data. At the same time, we also managed to improve the performance of all other detectors tested.

Keywords: Server farm telemetry, anomaly detection, periodic time series, pre-processing, mode removal

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