Name: Irwane Hammache
L0
Keywords : business process monitoring, business process monitoring and AI, deep learning, Tensorflow, machine learning-business monitoring
Source : Google Scholar

SUMMARY:

Title : Deep reinforcement learning for data-efficient weakly supervised business process anomaly detection

The paper delves further into the issue of anomaly detection in commercial processes, highlighting the significant financial consequences of these anomalies and the difficulties that come with identifying them. It begins by outlining the intricate nature of commercial processes, emphasizing that they are frequently characterized by interdependent sequences of activities, making it challenging for even human professionals to identify irregularities. Conventional anomaly detection techniques, such as process mining and statistical approaches, have been criticized for their reliance on a closed-loop data set and predefined process model, which are frequently absent from actual data sets.

The article then discusses the most recent developments in the field of learning-based automatic anomaly detection, with a focus on supervised, unsupervised, and semi-supervised approaches. It highlights the limitations of these approaches, such as the scarcity of tagged data and class imbalance, which impact their effectiveness.

The trial suggests a new approach based on deep reinforcement and poorly supervised learning to overcome these obstacles. This methodology uses a small dataset of labeled anomalies to increase detection accuracy while efficiently mining unlabeled data to identify new classes of anomalies.
A thorough use of techniques like variational autoencoders and long short-term memory networks is made to model business process data and address class imbalance.

The article also provides a detailed description of the experiments conducted to assess the suggested approach using both synthetic and real data sets. The outcomes of these experiments verify the superiority of the suggested approach over current methods.

Finally, the paper suggests a novel approach to anomaly detection in commercial processes that overcomes the drawbacks of conventional methods by making effective use of both tagged and untagged data.