Anomaly Detection Using Modified Linearity Based Grey Swarm Optimization Algorithm and Efficient Hyper parameter Optimization Techniques

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Abstract

Attacks and anomalies are quiet common in today’s technological world. However it is important to identify these anomalies as soon as possible since these anomalies can cause various problem. Therefore anomaly detection plays a vital role in detecting these outliers. Anomaly detection detects suspicious activity which fundamentally falls outside of the respected pattern of behaviour. Anomaly detection aims at identifying the unpredictable and unexpected events in data streams which are commonly referred to as anomalous events. Therefore proposed modified linearity based grey swarm algorithm and hyperparameter optimization techniques for improving the performance of the proposed model. Hyperparameter optimization techniques implemented in the proposed model are genetic algorithm (GA), Grid Search and Random Search. Feature selection is implemented in the proposed model is modified linearity based grey swarm algorithm since it has the ability to reduce the convergence. In addition to modified linearity based grey swarm algorithm, modified objective function is employed in the proposed model as it has the capability to find solutions to problems which are difficult to solve. Finally the performance of the proposed model is evaluated and assessed using various performance metrics such as accuracy, recall, precision and F1 score. At last, proposed model is compared with the existing models and found that proposed model outperformed other existing models.

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