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DISGAN: Efficient Generative Adversarial Network-Based Method for Cyber-Intrusion Detection

Authors : Hongyu Chen, Li Jiang

Abstract : Ubiquitous anomalies endanger the security of our system con- stantly. They may bring irreversible damages to the system and cause leakage of privacy. Thus, it is of vital importance to promptly detect these anomalies. Traditional supervised methods such as Decision Trees and Support Vector Machine (SVM) are used to classify normality and abnormality. However, in some case, the abnormal status are largely rarer than normal status, which leads to decision bias of these methods. Generative adversarial network (GAN) has been proposed to handle the case. With its strong generative ability, it only needs to learn the distribution of normal status, and identify the abnormal status through the gap between it and the learned distribution. Nevertheless, existing GAN-based models are not suitable to process data with discrete values, leading to immense degradation of detection performance. To cope with the discrete features, in this paper, we propose an efficient GAN-based model with specifically-designed loss function. Experiment results show that our model outperforms state-of-the-art models on discrete dataset and remarkably reduce the overhead.

Keywords : GAN, discrete feature, Wasserstein distance, multiple intermediate layers
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