

# 复杂时变拓扑网络异常数据检测优化仿真

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**摘要:** 针对复杂时变拓扑网络异常数据检测率、误检率较高的问题, 提取复杂时变拓扑网络异常数据检测优化方法. 引入密度空间聚类方法, 根据数据间的密度可达关系, 计算数据集的局部异常因子; 在获取局部异常因子基础上, 精简检测区域数据点的数量, 降低计算过程的复杂程度, 实现时变拓扑网络异常数据检测邻域优化; 结合信息增益, 对数据特征属性区分, 构建特征选择优化目标函数, 实现异常数据检测的特征属性优化. 实验结果表明, 经过改进后异常数据检测算法的性能明显提高, 保证了算法的高检测率与低误报率, 且运行时间更短.

**关键词:** 时变拓扑网络; 异常数据; 检测; 信息增益

## Optimization and simulation of abnormal data detection for complex time-varying topological networks

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**Abstract:** Aiming at the problem of high detection rate and false detection rate of abnormal data in complex time-varying topological networks, an optimization method for extracting abnormal data from complex time-varying topological networks is proposed. The density space clustering method is introduced to calculate the local anomaly factors of data sets according to the density reachability relationship between data sets. On the basis of acquiring local anomaly factors, the number of data points in the detection area is simplified, the complexity of the calculation process is reduced, and the neighborhood optimization of anomaly data detection in time-varying topological networks is realized. Combining with information gain, the feature attributes of data are distinguished, and the feature selection optimization objective function is constructed to optimize the feature attributes of anomaly data detection. The experimental results show that the performance of the improved anomaly data detection algorithm is significantly improved, which guarantees the high detection rate and low false alarm rate of the algorithm, and the running time is shorter.

**Key words:** time-varying topological network; abnormal data; detection; information gain

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