Correction of False Positives and False Negatives generated by IoT devices

Abstract: The proliferation of Internet of Things (IoT) devices across various domains necessitates robust and reliable data acquisition and analysis. However, these resource-constrained devices often suffer from inaccuracies, manifesting as false positives (incorrectly identifying an event) and false negatives (failing to detect a genuine event). These errors can have significant consequences, ranging from inefficient resource allocation to critical safety failures. This paper explores the challenges associated with false positives and false negatives in IoT environments, examining their sources and impacts. Furthermore, it surveys existing and potential techniques for mitigating these errors, including advanced sensor calibration, intelligent data fusion, context-aware anomaly detection, and machine learning-based classification with error correction mechanisms. The abstract concludes by highlighting future research directions aimed at developing more accurate and dependable IoT systems.