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LOW-COST PROTOTYPE FOR REALTIME CONDITION MONITORING WITH NOSQL CLOUD NATIVE DATABASE

Abstract:

This paper introduces a low-cost prototype developed using open source hardware and software for realtime condition monitoring in areas, like Industry 4.0, etc. The prototype utilizes Arduino® UNO R4 WiFi with sensors to record, send and store machine / environment data timely to cloud native NoSQL database. The machine / environment data stored in NoSQL is visualized with Grafana from both desktop browser and mobile devices. Realtime alert is sent to personnel in charge for necessary actions to be taken when abnormal machine conditions / environment data are detected. By monitoring key components and environmental factors in a machine or system, detecting deviations from optimal operational parameters, and facilitating timely intervention using this prototype, overall equipment effectiveness could be enhanced, and downtime could be reduced. The adoption of open source software offers several advantages, including cost-effectiveness, flexibility, and community support. This study could provide valuable insights into the development and implementation of low-cost Industry 4.0 condition monitoring solutions using open source software and hardware, addressing the growing demand for affordable yet efficient condition monitoring and maintenance strategies in industrial settings.

Keywords:

Conditional Monitoring, IoT, Industry 4.0, NoSQL Database, Cloud Native Database, Open Source Hardware, Open Source Software

JEL Classification: L17, L86, O14