IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 8, April 2025
Impact Factor: 7.67

Advanced Fault Detection and Identification in Brushless DC Motor using IoT

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Abstract: *The increasing reliance on Brushless DC (BLDC) motors in industrial automation, electric vehicles, and home appliances necessitates reliable and real-time fault detection systems to prevent operational failures and enhance performance. This project presents an advanced fault detection and identification (FDI) system for BLDC motors utilizing Internet of Things (IoT) technology. The proposed system integrates real-time data acquisition from various motor parameters such as current, voltage, temperature, and vibration through embedded sensors. These data are transmitted to a cloud-based platform via IoT modules for continuous monitoring and analysis.Using intelligent algorithms and machine learning models, the system can identify and classify common faults including bearing faults, phase imbalances, winding faults, and rotor misalignments. Alerts and diagnostic reports are generated instantly, enabling predictive maintenance and reducing downtime. The system's scalability and remote access capabilities provide a cost-effective and efficient solution for modern motor management. Experimental results demonstrate high accuracy in fault classification and early detection capabilities, making this approach a robust solution for intelligent motor health monitoring.The growing adoption of Brushless DC (BLDC) motors in a wide array of applications—including electric vehicles, robotics, HVAC systems, and industrial automation—demands reliable fault detection mechanisms to ensure operational efficiency, safety, and extended motor lifespan. Traditional fault detection methods often fall short due to limited real-time data availability and delayed responses. This project introduces an Advanced Fault Detection and Identification (FDI) system for BLDC motors using Internet of Things (IoT) technologies to overcome these limitations.*

Keywords: Brushless DC

DOI: 10.48175/IJARSCT-25553