Patent Search

Invention Title	SYSTEM AND METHOD FOR PREDICTIVE DIAGNOSTICS IN ROBOTICS USING DEEP LEARNING TECHNIQUES
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Inventor

Name	Address	Country	Nat
K. NARENDRA KUMAR	Assistant Professor, Department of Mechanical Engineering, GITAM School of Technology, GITAM deemed to be University, Visakhapatnam Campus, Andhra Pradesh-530045, India.	India	Indi
J. UMA MAHESHWARA RAO	Assistant Professor, Department of Mechanical Engineering, GITAM School of Technology, GITAM deemed to be University, Visakhapatnam campus, Andhra Pradesh-530045, India.	India	Indi
SIMHACHALAM BODDANA	Assistant Professor, Department of Mathematics, GITAM School of Technology , GITAM deemed to be University, Visakhapatnam campus, Andhra Pradesh-530045, India	India	Indi
Dr. S RAMANA KUMAR JOGA	Assistant Professor, Department of EEE , Dadi Institute of Engineering and Technology, Anakapalli, Andhra Pradesh, India	India	Indi

Applicant

Name	Address	Country	Nation
GITAM Deemed to be University	GandhiNagar Campus, Rushikonda, Visakhapatnam-530045, Andhra Pradesh, India.	India	India

Abstract:

The present disclosure discloses a Fuzzy IoT Data Fusion system for Real-Time Predictive Diagnostics in Robotic Systems using Deep Learning. The system seamlessly integ data fusion from IoT sensors with fuzzy logic and deep learning techniques to enable real-time predictive diagnostics, thereby significantly reducing downtime and enhanc reliability of robotic systems. The system encompasses various components such as the Fuzzy Data Preprocessor, IoT Sensor Integration Module, Deep Learning Model Se Fuzzy Logic Inference Engine, Predictive Diagnostic Generator, Robotic System Data Collector, Anomaly Detection Algorithm, Real-time Data Streamer, Data Fusion Engine, Adaptive Model Tuner, Event Triggering Mechanism, Predictive Maintenance Dashboard, Performance Analytics Module, and Alert and Notification System. These compon collaborate to collect, preprocess, analyze, and interpret data, ultimately generating predictive diagnostics and insights for continuous improvement of system performanc invention represents a novel and synergistic approach to predictive diagnostics in robotic systems, offering enhanced reliability and efficiency across various industrial applications. Fig. 1

Complete Specification

Description:TECHNICAL FIELD

[001] The present disclosure generally relates to the field of machine fault diagnostics. More particularly, the present disclosure relates to a system and method for predictive diagnostics in robotics using deep learning techniques.

BACKGROUND

[002] The convergence of robotics, the Internet of Things (IoT), and advanced data analytics has brought significant advancements to various industries, enabling enhanced operational efficiency through robotic systems. However, despite their benefits, the uninterrupted operation of robotic systems is paramount, and unforeseer downtimes can lead to substantial costs and disruptions.

[003] Traditionally, the maintenance of robotic systems has been reactive, often resulting in unplanned downtimes, expensive repairs, and operational interruptions. This reactive approach lacks a modular and predictive diagnostic system based on real-time streaming data. Existing solutions struggle to effectively integrate IoT sensor data, apply fuzzy logic inference, interpret complex data patterns, and accurately predict failures in robotic systems using deep learning models. Reactive maintenance strategies entail addressing maintenance and repair needs only after breakdowns or observable malfunctions occur, leading to costly downtimes and potential damage t equipment. Condition-based monitoring, while replacing unpopular regulatory inspections in certain sectors, relies on periodic data accumulation and analysis, often missing subtle anomalies or patterns that arise between inspections

View Application Status