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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Report on Technical Talk titled “AI Based Condition Monitoring”

Date: 27/07/2023

Timings: 1.30PM to 3.00PM

Venue: Aryabhata Seminar Hall, 2nd Floor, A Block

Organized by: Department of Electronics and Communication Engineering, K. S. School of Engineering and Management, Bengaluru in association with CSIR - NAL

Target Audience:

Faculties, 4th Sem A section students, Interested Students of other streams (CS, MBA, AI&DS,).

Scope and Objectives:

Session was chaired by Dr. Vadlamudi Parthasarathi Naidu. Dr. VPS Naidu started with what is Artificial and Intelligence separately and then he integrated both and explained need of artificial intelligence. He showed many videos, which is helpful in understanding artificial intelligence.

Speaker also informed that, Recent years, artificial intelligence (AI) has emerged as a powerful tool in various industries, transforming the way businesses operate and optimize their processes. One notable application of AI is in conditional monitoring, which involves the real-time analysis of data to predict the health and performance of equipment or systems. By leveraging AI algorithms, companies can detect potential issues, prevent unexpected failures, and improve overall efficiency, leading to cost savings and enhanced productivity.

80 Candidates attended the technical talk.

Key Components of AI-Based Conditional Monitoring:

Data Acquisition: AI-based conditional monitoring relies on the continuous collection of data from sensors, equipment, or systems. These sensors capture a range of parameters such as temperature, pressure, vibration, and more, providing a comprehensive view of the asset's condition.

Data Preprocessing: Before AI algorithms can analyze the data, it undergoes preprocessing to clean, filter, and normalize it. This step ensures that the data is accurate and ready for further analysis.

Machine Learning Algorithms: AI-based conditional monitoring employs various machine learning algorithms, such as supervised and unsupervised learning, to train models on historical data. These algorithms learn patterns and correlations between different parameters and equipment states, enabling them to make predictions based on real-time data.

Anomaly Detection: AI algorithms excel at identifying anomalies in data, indicating potential issues or deviations from normal operating conditions. By comparing real-time data with historical patterns, the system can flag abnormal behavior, triggering alerts for further investigation.

Predictive Maintenance: The primary goal of AI-based conditional monitoring is to enable predictive maintenance. Instead of relying on fixed schedules or reactive maintenance, predictive maintenance helps identify when equipment is likely to fail or require maintenance. This approach reduces downtime, extends equipment lifespan, and optimizes maintenance resources.

Benefits of AI-Based Conditional Monitoring:

Cost Savings: By predicting equipment failures and addressing issues proactively, businesses can avoid costly unplanned downtime and emergency repairs. This approach leads to significant cost savings in maintenance and operational expenses.

Increased Efficiency: Optimized maintenance schedules based on AI predictions ensure that maintenance tasks are performed when necessary, reducing unnecessary inspections and downtime.

Enhanced Equipment Lifespan: Identifying and addressing potential issues early on extends the life of equipment and reduces the need for premature replacements.

Improved Safety: AI-based conditional monitoring enhances safety by identifying hazardous conditions or equipment malfunctions, allowing companies to take corrective actions promptly.

Data-Driven Decision Making: The wealth of data generated through conditional monitoring enables data-driven decision-making, enabling companies to optimize processes and improve overall efficiency.



Fig 1: Dr. VPS Naidu Addressing the gathering



Fig 2: Event Poster



Fig 3: Participants listening to Dr. VPS Naidu

Conclusion by Speaker:

AI-based conditional monitoring is revolutionizing maintenance practices by providing real-time insights and enabling predictive maintenance. By harnessing the power of AI and data analytics, businesses can optimize operations, reduce costs, and enhance overall efficiency, giving them a competitive edge in today's fast-paced world. However, careful planning, data management, and interpretation are essential to fully leverage the potential of AI in this domain.

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