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Railways Health Monitoring Employing KSK Approach: A Novel AIIoT based Decision-Making Approach for Railways

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Abstract: *Central to this AIIoT approach is the implementation of machine learning algorithms that can process vast amounts of data generated from the sensors. These algorithms can identify patterns and anomalies that might indicate wear and tear or incipient failures in critical systems. For example, vibration sensors on trains can detect irregularities in wheel dynamics, while track-side monitoring systems can check for track integrity. By integrating these insights into a centralized health monitoring platform, railway operators are not only able to understand the current health status of their assets but also make informed decisions about maintenance schedules and resource allocation. Moreover, the innovative use of edge computing in this AIIoT framework allows for localized data processing, reducing latency and enabling immediate responses to critical situations. This is crucial in a railway environment where timely interventions can prevent accidents and improve service reliability. Additionally, the combination of AIIoT with cloud computing creates opportunities for advanced data analytics and machine learning models that can continuously improve their accuracy over time as more data becomes available. In essence, this novel AIIoT approach not only enhances operational efficiency but also aligns with broader initiatives aimed at making rail transport more sustainable by reducing unnecessary maintenance trips and optimizing resource utilization. The system informs the decision based on Track condition, speed of train, train condition to the authority.*

Keywords: AIIoT, Sensors, KSK approach, Railways, Health Monitoring, Decision Making

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