IBM PROJECT - PNT2022TMID26872

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DOMAIN : INTERNET OF THINGS

TITLE : **SMART SOLUTIONS FOR TAILWAYS**

Internet of things for smart railways Feasibility and Application :

The explosively growing demand of Internet of Things (IoT) has rendered broadscale advancements in the fields across sensors, radio access, network, and hardware/software platforms for mass market applications. In spite of the recent advancements, limited coverage and battery for persistent connections of IoT devices still remains a critical impediment to practical service applications. In this paper, we introduces a cost-effective IoT solution consisting of device platform, gateway, IoT network, and platform server for smart railway infrastructure. Then, we evaluate and demonstrate the applicability through an in-depth case study related to IoT- based maintenance by implementing a proof of concept and performing experimental works.

The IoT solution applied for the smart railway application makes it easy to grasp the condition information distributed over a wide railway area. To deduce the potential and feasibility, we propose the network architecture of IoT solution and evaluate the performance of the candidate radio access technologies for delivering IoT data in the aspects power consumption and coverage by performing an intensive field test with system level implementations. Based on the observation of use cases in interdisciplinary approaches, we figure out the benefits that the IoT can bring.

Smart Train Detector using IOT :

Only metal detection in railway tracks to indicate the movement of train is not sufficient. The sensors present in the railway tracks can detect any metal object, be it a train or mere a coin. Thus, in order to make the working more foolproof, introduction of another parameter, i.e., weight on the railway track is necessary. This paper describes an approach to collaborate metal detection with weight detection in railway tracks to detect the train movement using the principle of IoT,using the load cells along with the metal sensor.

Smart Train Accident Detection and Prevention System using IOT Technology :

The point of this paper is to plan and foster a finger impression based train motor getting to framework with a perspective on lessening manual working and to avert unauthorised users. As of late, train commandeer has been on the increment as equipped burglars center around taking vehicles, particularly the pristine ones. This is accomplished with the utilization of a finger impression module, ATMega328P microcontroller and Liquid Crystal Display (LCD) module. Correspondence based train control (CBTC) [8] is a control mechanism which use bidirectional train–ground to operate the trains in a safer manner. Since there is problem in controlling the train via remote operation and its transportability, wireless networks can be incorporated to manage the execution of train control system.For that we used ESP2866 wifi module which is used for uploading the train engine drivers database into the server. However we can avoid this collision and prevent the train from accident by utilizing the impact identification innovation which can be made by ultrasonic sound. This technology is used to detect the obstacle and it gradually slow down the speed of the train by applying the air brake to stop the train before the mishap occurs.

Railways Components Wear: A smart platform :

The railway components subjected to wear, e.g. ballast, sub-ballast, sleepers and general infrastructures, may generate off-design conditions which produce wear to the rail machines, as wagons and locomotives. The present work aims at describing a methodology which was followed to classify the infrastructure anomalies and analyse the possible induced effect on the rail machines. A platform was developed to include and manage the activities and data concerning the maintenance state of the components. In detail, the platform modules involved the spare part and storage management, the testing activities, the processing technologies for part restoring and used machines. The project was developed in collaboration with an Italian company which is daily involved in maintenance activities for rail machines and facilities.