SMART SOLUTIONS FOR RAILWAYS
LITERATURE SURVEY

TITLE: Crack detection in railway axle using horizontal and vertical vibration measurements

AUTHOR: HASSAN

DESCRIPTION: In this paper, numerical investigations are carried out to assess the possible use of vibration measurements to identify the presence of a fatigue crack in railway axles. A non-linear finite element model of a cracked axle, reproducing the crack breathing mechanism, is introduced. The solid model of the axle is built in the ABAQUS FEM software and a crack is introduced in it. Numerical simulations are presented for two different types of axle: hollow ones, as in passenger trains, and solid ones, as in freight trains. Simulation are carried out for different possible locations of the crack and different measuring points for the monitoring equipment. Results indicate that the presence of a crack in the shaft affects not only the vertical vibration signal, but also the horizontal (perpendicular to the axle axis) one, generating harmonic components of bending vibration at frequencies that are multiple integers of the frequency of revolution of the axle. Results revealed also that the horizontal vibration provides promising indicators of axle fault development because the effect of various sources of disturbance, namely wheel outofroundness, can be more easily dealt with.

PUBLISHED IN: 2011

TITLE: Robust Railway Crack Detection Scheme (RRCDS) Using LED-LDR Assembly

AUTHOR: Vigneshwar Murali

DESCRIPTION: In India, most of the commercial transport is being carried out by the railway network and therefore, any problems in the same has the capacity to induce major damage to the economy-notwithstanding the societal impact of loss of life or limb. This paper proposes a cost effective yet robust solution to the problem of railway crack detection utilizing a method that is unique in the sense that while it is simple, the idea is completely novel and hitherto untested. The paper discusses the technical and design aspects in detail and also provides the proposed robust crack detection algorithm. The paper also presents the details of the implementation results of the RRCDS utilizing simple components inclusive of a GPS module, GSM Modem and LED-LDR based crack detector assembly. The proposed scheme has been modelled for robust implementation in the Indian scenario.

PUBLISHED IN: 2012

TITLE: An Enhanced Crack Detection System for Railway

AUTHOR: Muralitharan

DESCRIPTION: In this project we introduced the integration of railway track surveying system. In our proposed system it is used to detect the railway crack. This project consists of IR sensor& fire sensor. The IR sensor is used to detect the crack and as well as distances, fire sensors used to detect the fire accidents. To communicate the received information, we make use of a GSM modem. The GSM module is being used to send the current latitude and longitude data to the relevant authority as an SMS. The importance of this project is applicable both day & night time detection process applicable both day & night time detection process.

PUBLISHED IN: 2015

TITLE: Formal verification of movement authorities in automatic train control systems

AUTHOR: Shiladitya Ghosh

DESCRIPTION: The safe functioning of a train control system is critically dependent on the validity of the movement authorities issued to a train by the track-side radio control blocks (RBC). In order to guarantee that the movement authorities are safe, the RBC needs to consult the interlocking logic. The RBC and the interlocking logic has to be configured with data specific to the yard of operation. This paper aims to validate the data using formal methods. Specifically we present an approach for proving that the trains maintain safe distance between them when they follow the movement authorities issued by the RBC in a yard. We use UPPAAL [13] for modelling the train control system System for a small yard including the continuous dynamics of trains. The UPPAAL model-checker is used to verify the safety of all train movements permitted by the model. We demonstrate that errors in the logic can be detected by the proposed method in feasible time. As opposed to previous approaches using theorem proving techniques, our method lends itself easily to automation, which is thereby more acceptable to railway engineers.

PUBLISHED IN: 2016

TITLE: Wireless sensor network for real time monitoring and controlling of railway accidents

AUTHOR: Sagar Shinde

DESCRIPTION: Railway accidents and safety is crucial aspect in railway sector of all over the world. Actually accidents are often taking place due to breakage of track. It is a need to be identified breakage in track in real time before a train actually comes near to the broken track and get subjected to an accident. It is a complex and massive problem of railways for a life security and timely management of services. In proposed system a vibration sensor has been used for detecting cracks in the railway tracks and obstacles. In tunnel light will on and off when train entering and leaving the tunnel respectively with the help of load cell and switching circuitry for the energy consumption in tunnel and   by using IR sensor, energy has been consumed in boogie.

 PUBLISHED IN: 2017

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ABSTRACT:

Nowadays railways are going in a modern way, there are several technologies are added to these systems, in addition to there are so more technique is used in this project. Usually, passengers are booking a ticket for railways online, then the seats are reserved when they travel on the date, they travel with tickets and end with a happy journey. But there are some fraudulent activities in these reservations of tickets. Due to avoid these activities, Web UI is used when the ticket is reserved, also QR CODE is generated along with UNIQUE ID. These are stored in a cloud and DB using Python. The components of IoT devices and IoT platforms are also generated with a UNIQUE ID. When the ticket collector is asked for the passengers to a ticket, that QR CODE with a UNIQUE ID is already in the database. The new random Python is also stored and visible to the ticket collector. He verifies that ticket. Using this technology, Cheaters are unable to do indiscipline activities. Even though they have done it can be easily identified. It is very useful for railway departments to punish fraud person.