Project Title : SMART SOLUTIONS FOR RAILWAYS

Team Leader : R. Daisy

Team Members : R. Banupriya

P. Kaviya

C. Lakshmi

PRE-REQUISITE :

To complete our project, we must have knowledge of the following. We need to have basic knowledge of the following cloud services:

- IBM Watson IoT platform
- Node-RED Service
- Cloudant DB

GITHUB ACCOUNT :

- Open https://github.com in a web browser, and then select Sign up.
- Enter your email address.
- Create a password for your new GitHub account, and Enter a username, too. Next, choose whether you want to receive updates and announcements via email, and then select Continue.
- Verify your account by solving a puzzle. Select the Start Puzzle button to do so, and then follow the prompts.
- After you verify your account, select the Create account button.
- Next, GitHub sends a launch code to your email address. Type that launch code in the Enter code dialog, and then press Enter.
- I have created my github account with the email id einstein.dblk@gmail.com .

INSTALLATION OF IDLE:

Python is available from its website python.org. Once there, hover your mouse over the Downloads menu, then over the Windows option, and then click the button to download the latest release.

LITERATURE SURVEY :

Review - 1

Title Of The Paper :

Smart Railway Based On The Internet Of Things

Author   :

Qingyong Y.Li, Zhangdui D.Zhong

Problem Description :

Railway networks across the world are getting busier and busier; trains travel at higher speeds and carry more passengers or heavier axle loads than ever before. Accordingly, the railway industry calls for new information technologies (ITs) to meet its development. Railway systems have already relied on ITs almost as much as they rely on physical assets, and this dependence is growing as these systems face burgeoning demands in terms of robustness, reliability, and capacity. This chapter will discuss the framework and related technologies for a smart railway based on the Internet of Things (IoT) and big data. On the other hand, we introduce the intelligent rail inspection system, which can be regarded as a case or application of the smart railway. The smart railway shows the potential of improving traditional railway systems with the development of the IoT and big data.

Review – 2

Title Of The Paper :

A Review on Industrial IoT-Connected Railways Industrial IoT Connected Railways

Author :

Paula Fraga-Lamas , Tiago M. Fernández-Carames and Luis Castedo .

Problem Description :

The railway industry is expected to rely upon smart transportation systems that leverage technologies over a large rail network infrastructure to reduce its life-cycle cost. New services, such as integrated security, asset management, and predictive maintenance, are expected to improve timely decision-making for issues like safety, scheduling, and system capacity. Smart railways represent a combination of interconnected technological solutions and components, as well as modern transportation infrastructure like automatic ticketing systems, digital displays, and smart meters. Likewise, these systems require seamless high data rate wireless connectivity and integrated software solutions to optimize the usage of assets, from tracks to trains, to meet the ever-growing demand for energy-efficient and safer services. The driving factors of the smart railways are expected to enforce the growth of the industry. These factors include the increasing importance of sustainability, government regulations, demographics (i.e., growing traffic of passengers and freight, aging population, and rapid urbanization), macroeconomics (i.e., limited public funding and government deficit, government initiatives and partnership models), microeconomics (i.e., price sensitivity, demands for an improved passenger experience, stakeholders interests), the growing importance of smart cities, the incredible pace of telecommunications and technological change, and the need for mobility.

Review - 3

Title Of The Paper   :

The Internet Of Smart Trains.

Author   :

Paula Fraga-Lamas, Luis Castedo

Problem Description   :

The railway industry is in a position where it is able to exploit the opportunities created by the IIoT (Industrial Internet of Things) and enabling communication technologies under the paradigm of Internet of Trains. This review details the evolution of communication technologies since the deployment of GSM-R, describing the main alternatives and how railway requirements, specifications and recommendations have evolved over time. The advantages of the latest generation of broadband communication systems. The emergence of Wireless Sensor Networks (WSNs) for the railway environment are also explained together with the strategic roadmap to ensure a smooth migration from GSM-R. Furthermore, this survey focuses on providing a holistic approach, identifying scenarios and architectures where railways could leverage better commercial IIoT capabilities. After reviewing the main industrial developments, short and medium-term IIoT-enabled services for smart railways are evaluated. Then, it is analyzed the latest research on predictive maintenance, smart infrastructure, advanced monitoring of assets, video surveillance systems, railway operations, Passenger and Freight Information Systems (PIS/FIS), train control systems, safety assurance, signaling systems, cyber security and energy efficiency. Overall, it can be stated that the aim of this article is to provide a detailed examination of the state-of-the-art of different technologies and services that will revolutionize the railway industry and will allow for confronting today challenges.

Review – 4

Title Of The Paper :

Enhanced Railway Reservation System using Internet of Things

Author :

Basetty Mallikarjuna , Arun Kumar Reddy Dodd

Problem Description :

The developed countries has been implemented smart train using internet of things (IoT), IoT provide exploit the opportunities created by Industrial Internet of Things (IIOT). In this paper the survey focuses on different communication technologies under the paradigm of IoT. The broad band communication technologies like Global System Mobile Communications- Railway (GSM-R), Long Term Evaluation (LTE), fifth generation (5G), IEEE 802.11 and Wireless Sensor Networks (WSN). They described the passenger ticket generation, ticket validation, with Unique Identification Authority of India (UIDAI) under the smart train transportation the vision of India 2022 and the experimental result proved that IoT system is effective than well known system.

Review – 5

Title Of the Paper :

Smart Railway Automation System Using IoT- a Literature Survey.

Author :

Dr. A. Benjamin Joseph, Mohan kumar aradhya M S.

Problem Description :

Even with greatest of ideas to avoid railway accidents, many trains accidents still happen worldwide. This paper shares an idea on how to avoid train collision by using an automated control incorporated in the trains. In this paper, they have implemented ideas such as pre-crashing using RFID sensor, ultrasonic sensor in-order to choose an array of commands which would run as per the conditional algorithm created in the microcontroller. They uses EPM to control the speed of the motor to lessen speed. This system will be more efficient since it was fully automated and also it was cost effective.

PAPER REFERENCE :

- COOPER Dave E. Intelligent transportation systems for smart cities:a progress review[J]. Science China(Information Sciences), 2012, 55(12):2908-2914.
- Stefansson G, Lumsden K. Performance issues of Smart Transportation Management systems[J]. International Journal of Productivity & Performance Management, 2009, 58(1):55-70.
- Huang X. Smart Antennas for Intelligent Transportation Systems[C]// International Conference on ITS Telecommunications Proceedings. IEEE, 2006:426-429.
- Li X, Song J. The Top Design Methodology of Smart City in China[C]// International Conference on Intelligent Computation Technology and Automation. IEEE, 2014:861-864.
- Jianbo, Cheng, Peng. Top-Level Design of Smart City Based on "Integration of Four Plans"[J]. ZTE Communications, 2015, 13(4):34-39.
- Lanke N , Koul S , Lanke N , et al. Smart Traffic Management System[J]. International Journal of Computer Applications, 2014, 75(7):19-22. [8] Bouhedda M, Bellatreche S, Ahmed-Serier R. Smart traffic signal controller design and hardware implementation based ant colony system[C]// International Conference on Modelling, Identification and Control. IEEE, 2017:1110-1116