**ABSTRACT**

The explosively growing demand of internet of things (IOT) has rendered broad scale advancements in the fields across sensors, radio access, network, and hardware/software platforms for mass-market applications A Cost-effective IOT solution consisting of device platform, gateway, IOT network and platform server for smart railway infrastructure. The IOT solution applied for the smart railway application makes it easy to grasp the condition information distributed over a wide railway area. One of the important issues for railway operators is maintenance of their railway systems. The railway system consists of various entities including train vehicles, tracks, facilities (te. tunnels and bridges), catenary and electrical devices in trackside. The proposed railway locomotive monitoring systems as the facilities like estimation of the fuel consumption & distance covered by train detect unwanted objects on tracks & any cracking in the tracks and also provide health services to the passengers. Project describes the range of sensing technologies has expanded rapidly, whereas sensor devices have become cheaper. This has led to a rapid expansion in condition monitoring of systems, structures, vehicles, and machinery using sensors. Key factors are the recent advances in networking technologies such as wireless communication and mobile ad hoc networking coupled with the technology to integrate devices. It can be used for monitoring the railway infrastructure such as bridges, rail tracks, track beds, and track equipment along with vehicle health monitoring such as chassis, bogies, wheels, and wagons. Condition monitoring reduces human inspection requirement through automated monitoring, reduces maintenance through detecting faults before they escalate, and improves safety and reliability. This is vital for the development, upgrading, and expansion of railway networks.

**LIST OF FIGURES**

|  |  |  |
| --- | --- | --- |
| **S.NO** | **TITLE** | **PAGE NO** |
| 1 | MEMS Sensor | 8 |
| 2 | IR Sensor | 9 |
| 3 | Voltage Sensor | 9 |
| 4 | RF rx & RF tx | 10 |
| 5 | PIC microcontroller | 11 |
| 6 | DC motor | 12 |
| 7 | LCD monitor | 13 |
| 8 | UART | 13 |
| 9 | HTML Components | 19 |
| 10 | Browser Output 1 | 30 |
| 11 | Browser Output 2 | 30 |
| 12 | Browser Output 3 | 31 |
| 13 | LCD output | 31 |

**LIST OF ABBREVATIONS**

|  |  |  |
| --- | --- | --- |
| **S.NO.** | **ABBREVATIONS** | **PAGE NO.** |
| 1 | IOT-Internet of Things | 1 |
| 2 | MEMS-Micro Electro Mechanical Systems | 2 |
| 3 | IR-Infrared | 2 |
| 4 | LCD-Liquid Cell Display | 2 |
| 5 | Wi-Fi Wireless Fidelity | 2 |
| 6 | M2M-Machine to Machine | 4 |
| 7 | M2SP-Machine to Machine Service Platform | 5 |
| 8 | QoS-Quality of Service | 6 |
| 9 | OFDMA-Orthogonal Frequency Division Multiple Access | 6 |
| 10 | MIMO-Multiple Input Multiple Output | 6 |
| 11 | UART-Universal Asynchronous Receiver Transmitter | 7 |
| 12 | DC-Direct Current | 7 |
| 13 | RF tx-Radio Frequency transmitter | 7 |
| 14 | RF rx- Radio Frequency receiver | 7 |
| 15 | PIC-Peripheral Interface Controller | 7 |
| 16 | HTML-Hyper Text Markup Language | 9 |
| 17 | SOC-System On Chip | 12 |

|  |  |  |
| --- | --- | --- |
| **CHAPTER** | **TITLE** | **PAGE** |
|  | **ABSTRACT** |  |
|  | **LIST OF FIGURES** |  |
|  | **LIST OF ABBREVATIONS** |  |
|  | **INTRODUCTION** |  |
|  | 1.1.Aim |  |
|  | 1.2.Synopsis |  |
|  | **SYSTEM ANALYSIS** |  |
|  | 2.1.Existing system |  |
|  | 2.2.Proposed system |  |
|  | 2.2.Literature Survey |  |
|  | **REQUIREMENTS SPECIFICATION** |  |
|  | Introduction |  |
|  | Hardware Specifications |  |
|  | MEMS Sensor |  |
|  | IR Sensor |  |
|  | Voltage Sensor |  |
|  | WiFi Module |  |
|  | RF tx & RF rx |  |
|  | Micro controller |  |
|  | DC Motor |  |
|  | LCD Monitor |  |
|  | UART |  |
|  | Software specification |  |
|  | MP LAB |  |
|  | Embedded C |  |
|  | HTML |  |
|  | **PROJECT PURPOSE** |  |
|  | Purpose |  |
|  | Product Perspective |  |
|  | SystemFeatures |  |
|  | Design and Implementation Constraints |  |
|  | Other Non-functional Requirements |  |
|  | **SYSTEM DESIGN** |  |
|  | System Design |  |
|  | Modules |  |
|  | Main Unit |  |
|  | Receiving Unit |  |
|  | Train Unit |  |
|  |  |  |

**TABLE OF CONTENTS**

**CHAPTER TITLE PAGE**

**ABSTRACT**

**LIST OF FIGURES**

**LIST OF ABBREVATIONS**

1. **INTRODUCTION** 
   1. Aim
   2. Synopsis
2. **SYSTEM ANALYSIS**

2.1 Existing system

2.2 Proposed system

2.3 Literature Survey

2.4 System Design

3 **REQUIREMENTS SPECIFICATION**

3.1Introduction

3.2Hardware Specifications

3.2.1. MEMS Sensor

3.2.2. IR Sensor

3.2.3. Voltage Sensor

3.2.4. WiFi Module

3.2.5. RF tx & RF rx

3.2.6. Micro controller

3.2.7. DC Motor

3.2.8. LCD Monitor

3.2.9. UART

3.3 Software specification

3.3.1.MP LAB

3.3.2 Embedded C

3.3.3.HTML

4 **PROJECT PURPOSE AND SCOPE**

4.1Purpose

4.2Product Perspective

4.3SystemFeatures

4.4Design and Implementation Constraints

4.5Other Non-functional Requirements

5 **SYSTEM DESIGN**

5.1 System Design

5.2 Modules

5.3 Module explanation

6 **CODING AND TESTING**

6.1 Coding

6.2 Coding standards

6.3 Test procedure

6.4 Test data and output

7 **CONCLUSION AND FUTURE SCOPE**

8 **SAMPLE CODE**

9 **REFERNCE**