# DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

## IBM – LITERATURE SURVEY

## PROJECT TITLE

## SMART SOLUTIONS FOR RAILWAYS

(2022-2023)


**Guide Name: Dr.S. Vijayakumar**

**SUBMITTED BY**

**AISHWARYA.K - 19105001**

**AJAY KUMAR.M - 19105002**

**ANBARASAN.G - 19105003**

**ANU VARSHITHA.M - 19105004**

**FINAL YEAR B.E. (ECE)**

**PAAVAI ENGINEERING COLLEGE,**

**Paavai Nagar, NH-7, Pachal, Namakkal-637018, Tamil Nadu**

| S.NO | TITLE OF THE PROJECT | ADVANTAGES | DIS ADVANTAGES | TECHNOLOGY USED |
|---|---|---|---|---|
| 1. | 5G Key Technologies for Smart Railways | Many innovative methodologies were available to enable designers to achieve these goals, and thus further push the smart rail development back until the 5G key technologies appeared. In particular, 5G key technologies offer much faster data rate and larger coverage area. Ericsson Mobility Report forecasts in its June 2019 edition that 35% of global mobile connections will be carried out on 5G networks and 5G users will reach 1.9 billion, which is up to 65% of the global population | The mobile service amount of the train and the low-mobility user. It is observed that the derivative of the service amount of the train first increases and then decreases | 5G Key Technologies |
| 2. | The Safety Measures of AIoT-based Railway Infrastructures | The advancement of AIoT technologies, a tremendous number of IoT sensors and actuators and IoT monitoring network will be deployed in the railway infrastructure for continuous | The system failures can be caused by the faults in application requirements, the deficiencies in the infrastructure design, the deficiencies during manufacturing, software errors | AIoT Based as Crucial Technologies |

| | | | | |
|---|---|---|---|---|
| | | safety evaluation. The IoT sensors will measure and transfer the essential parameters, such as voltage and current in the railway network, the acceleration, vibration and position of the trains, the noise levels during operation, etc. | | |
| 3. | Devices for Power Quality Compensation in Railway Traction Power Supply | Railway power quality conditioner was one of the FACTS devices specially proposed for railway traction power supply. Railway power quality conditioner is commonly known as RPC. | For instance, electric train draws inductive reactive power from the system, which causes power factor and voltage stability problem. In addition, electric train loadings are rarely balanced, | Railway HPQC and half-bridge RPC |
| 4. | Failure management strategies for IoT-based railways systems | Security and reliability are crucial requirements for systems that monitor and control critical infrastructures like railways systems. In order to cope with external threats and minimise the possibility of malfunctioning, railways systems have been | In order to evaluate the performance of the mechanism to detect and react to temperature sensor failures | Future IoTbased railways systems. |

| | | | | |
|---|---|---|---|---|
| | | typically designed to work in isolation without - or with limited - interaction with other systems, internal or external. | | |
| 5. | Positive Train Control (PTC) | This generation of train control detects the train by use of track circuits and wayside signal guides the train operators on movements along the track, if the wayside signal displays an eminent danger, the trip stops. With this train control concept, virtually all of the train control logic and equipment is located on the wayside, with train borne equipment limited to trip stops. | PTC cyber security Cybercrime is a growing threat to infrastructure. | positive train technology also referred to as PTC . |
| 6. | Smart Railway: Feasibility and Applications | The terminals are required to have a long battery life for covering some areas in which power supply is not available. The terminals deployed near catenary can use power supply, | A limited coverage for collecting condition information. | GSM-R and will feel more familiar with LTE |

| | | | | |
|---|---|---|---|---|
| | | but there are many cases in which the terminals should rely on its battery. | | |
| 7. | GSM-R and will feel more familiar with LTE | The highest priorities in designing railway track are safety ,low cost of maintenance and standardaization. For new methods of reducing noise to be accepted,they must be capable of being fitted to the establish infrastructure design with minimal change to railway practice | The rail damper elastomer would also have a lower stiffness and therefore a lower tunning frequency | Standard U160 |
| 8. | Power Allocation for Millimeter-Wave Railway Systems | Power allocation plays a significant role in the mmWave HSR communication system, which directly has influence on its efficiency and reliability. | Moreover, the performance of both the random power and maximal power schemes is always poorer than FP | Millimeter wave railway system |
| 9. | Simulation Based Evaluation Of Handover Mechanisms In High speed Railway control And communication systems | In LTE communications, handover is the process that moving user equipment (UE) switches an ongoing session from one base station | Smaller window size is more likely to result in an early-trigger because of the higher probability of a non-decreasing signal quality sequence in the | Interleaved PCI |

| | | | | |
|---|---|---|---|---|
| | | | window | |
| 10. | Renewable Energy Sources Integration and Control in Railway Microgrid | The intelligence of the proposed control by MAS allows the battery to be charged from the RES generated power while trains are stopped and during deceleration periods, to reuse the stored energy during acceleration periods. | The processing of these data by the agent indicates whether a request for energy supply is required, due to an acceleration in order to suppress the voltage drop on the line, or a consumption demand in order to remove the voltage | .RAILWAY CONTROL BY MAS |