

Sri Venkateswaraa College of Technology

Sriperambudur

Department of Electronics and Communication Engineering

IBM- NALAYA THIRAN

TITLE: Smart Solutions for Railways

Team ID: PNT2022TMID38325

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MENTOR: SATHISH KUMAR M

LITERATURE SURVEY

1. **TITLE** : **Smart Solutions For Railways**

Authors: N. C. Brintha;Chakka Venkata Pavan Tarun;Lingisetty
Abhishikth;Bitra Purna Koteswara Rao;Maddika Taruneshwar Reddy

Description:

Most of us waste hours of our lives waiting near railway gates due to the traditional human management system imbedded near railway gates, and many individuals have lost their lives by mistakenly crossing the gate at the moment of train arrival near railway gate. In our proposed solution, we have addressed these issues by displaying whether the railway gate is opened or closed based on the train passing, the most recent gate closure timestamp, and each time when the gate is closed, a centralized platform for knowing the condition of the gate, traffic density, and intrusion detection near the railway gate. Based on the experimental results, this automated railway crossing assistance outperformed human-assisted railway crossings, resulting in an efficient and cost-effective solution for traffic regulation and avoidance of accidents at railway gates.

2. **TITLE** : Controlling railway gates using Smart phones by tracking with GPS

Authors: R. Velayutham;T. Sangeethavani;K. Sundaralakshmi

Description:

Railway is the most commonly used transportation vehicle. Most of the people choose this transportation mainly for low cost and it gives comfort ability. To increase this comfort zone and to reduce the number of accidents, our system gives a complete solution. Nowadays, we met a lot of railway accidents. Most of these accidents occur at railway gate level crossings. Up to date there are several proposals to avoid the number of accidents and to reduce the manpower at railway gates. Most of the proposals used sensors as a key device to detect the arrival of the train but which requires maintenance cost and it is not efficient method. It also requires monitoring process to detect the fault in sensors. This paper track and detect the arrival of the train by using GPS and not by the sensors. This way of train tracking using GPS is embedded with our mobile application. Using this application the engine driver controls the railway gate.

3. **TITLE** : The IDex Safety Measures of An IoT-based railway Infrastructures

Authors: C. K. Wu, Y. He, K. F. Tsang and S. Mozar

Description:

Railway safety is a tremendously essential aspect of urban management. The railway network is a highly sophisticated infrastructure comprising numerous devices, machines, networks, services, etc. Therefore, the Internet-of-things (IoT) and Artificial Intelligence (AI) can be conceived as the crucial technologies for enabling ubiquitous data collection and unmanned decision-making, respectively. The IoT maturity index, namely the IDex, will be standardized to provide a comprehensive evaluation for all IoT objects pertinent to their performance and application requirements.

4. **TITLE:** 5G Key Technologies for Smart Railways

Authors: B. Ai, A. F. Molisch, M. Rupp and Z. -D. Zhong

Description:

Railway communications has attracted significant attention from both academia and industries due to the booming development of railways, especially high-speed railways (HSRs). To be in line with the vision of future smart rail communications, the rail transport industry needs to develop innovative communication network architectures and key technologies that ensure high-quality transmissions for both passengers and railway operations and control systems. Specifically, we have identified significant 5G-based key technologies for HSRs, such as spatial modulation, fast channel estimation, cell-free massive multiple-input-multiple-output (MIMO), mmWave, efficient beamforming, wireless backhaul, ultra-reliable low latency communications, and enhanced handover strategies.

References

¹N. C. Brintha;Chakka Venkata Pavan Tarun;Lingisetty Abhishikth;Bitra Purna Koteswara Rao;Maddika Taruneshwar Reddy

²R. Velayutham;T. Sangeethavani;K. Sundaralakshmi

³C. K. Wu, Y. He, K. F. Tsang and S. Mozar

⁴B. Ai, A. F. Molisch, M. Rupp and Z. -D. Zhong