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# Review Paper on Auto Pilot Control System

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Abstract: Railways have been a dominating transportation system in almost every country. Indian railway is one of the largest networks that carry almost 22 million passengers every day. This transportation system carries a large number of passengers from one place to another. The main advantage of railways is that it is a traffic-free mode of transportation and relatively lower cost. However, as the network is so wide, there are many train accidents occurred now a days. These accidents are caused by several reasons. Most of the train accidents are due to two reasons one is technical error and other is human error. The human error includes many factors like different climatic conditions in day and night; geographical changes and some time the lack of Alertness. A critical situation that causes these Railway accidents is the absence of a Real Time Train Control System. This Paper Proposes an Auto pilot Train Control System. This Control System uses some AR markers that give some information to the readers attached to the train. As the train moves, the readers will read the markers and perform the operation that is associated with the read Information. To improve the performance of this System, we use the RFID (Radio Frequency Identification) along with the AR markers. After ORing the information from AR markers and RFID Readers, the control system will perform operation accordingly.

Keywords: Augmented Reality, RFID, Image Processing, GPS, Railways.

### I. INTRODUCTION

The Railway is an influential mode of Transportation. The need of a reliable Train control system continues to be the issue of concern across the globe. One of the major concern is to control the number of accidents occur every year in the country. Every country is haunting to bring changes in the existing rail infrastructure because of the Lack of operational efficiency and reliability, safety and security. The department of Railways struggles progressively to meet the demand of optimized rail network and efficient use of rail assets. The requirement is to build smarter and more efficient train Control systems. Development is Railway industry sets new benchmarks for the upcoming one. The evolution from Coal based Mechanical Train control systems to the Electric/ computerized Train control systems where the train are now using computer, GPS etc is successfully achieved. To provide the new milestones in the current system, the Auto pilot mode Trains is proposed in this research. The proposed system will not only increase the standard of Railways but also reduce the possibility of accidents caused by Human Error.

In a real time monitoring system that includes real time tracking of the actual current position of a train. The data is displayed on a web site so that train station officials monitor the data. The system also notifies passengers that their train is approaching or having delay. If someone is facing difficulties in locating the station, this real time monitoring system also assists the passengers to find the stations by using AR. The AR was implemented by using the inclination angle and azimuth to find the best route. The system is predictable in finding station based on image-based searching by 94.18% accuracy. However,

if passenger forgets the name of station, then only the user need to provide the picture of station to the system. The system will recognize the station by extracting the details from the picture, and match with the database.

The proposed research will equip this image processing techniques by using the AR Markers and RFID Readers. In this research automated train control system is introduced that uses some AR markers depicting some factors such as physical conditions like weather, railway track, lights, inclination, distance between stations, population of area where Train moves etc. to control some operation such as speed control, horn, light on/off etc. This Auto Pilot Train Control system will be developed by using the Augmented Reality by analyzing some marker and the associated operations will be performed.

This research will establish a real to real world communication in augmented reality. As the train moves form source to destination it encounters some AR markers that are attached somewhere on the way. These Markers are read by the camera attached in the control system of the Train. Also there are Some RFID Tags along with the AR Markers because there are some conditions such as fog, dust or improper light etc. that may restrict the camera to capture the image properly. So we are using the RFID tags so that the proper information will be read by the Readers. After gathering information for AR markers and RFID Tags, the OR Operation will be performed on both outcomes. The Final result will be used to perform the associated operation that will be available in the Database.

Now discuss how RFID Works ?

In a basic RFID system, tiny chip scaled tags are attached to the items that are to be tracked. These tags are connected to an antenna. The tag chip contains memory that stores the product's code and other variable information that can be read and tracked by RFID reader. A RFID reader is a network connected device that sends power, data and commands to the respective tags.





#### **II. LITERATURE SURVEY**

The Main Aim of [1] to implement a real world to an augmented image. This can be done by capturing the object and follow some image processing algorithms to get an effective augmented image. The paper define implementation is in two stages. First stage is for detecting a fiduciary marker and in second stage augmenting it with a virtual environment.

Stage1: Detection of Data and features.

Stage2: In second phase the Real World Coordinate is summed up with Data from Stage 1.

Various Method such as Projective Geometry, rotation representation, Geometric algebra, Non-linear optimization, and robust stats are used in this stage. The final conclusion of [1] is to enhance real world image by super imposing the virtual object

over it image processing technique. In research [1] there is discussion about different feature detection or extraction techniques such as edge detection, Corner Detection, blog detection and object orientations and tracking to obtain an efficient augmented image.

In research paper [2] provided the details for RFID technology that has been widely utilized for tracking and identification of Number of stationary and moving objects. The research is mainly identifies the issues related to RFID tags reading in the high Speed train system and the various ways to solve these with the improvement in reliability, scheduling and efficiency of large- scale Transportation infrastructure.

The main aim of research [4] is to enhance the features of high-speed railway systems with automatic control systems. In [4] a

Numerical modeling of Chinese high-speed train system and its automatic control systems are discussed. Also the modeling and

Simulation of Automatic train systems are analyzed and demonstrated successfully in [4]. This Paper [4] provides detailed

Information of the two data sets on this the Railway control system works. It gives a network model for the high speed train and

Also an automated control system for the operation. Study shows that a train is a complex hybrid with Air-fluid- soil subsystem. In this paper [5], the aim is to provide the train interlocking. The Train Interlocking means preventing then trains from collisions

And derailing while without inferring the normal train movements. The formal methods for the interlocking are advanced in terms Of z notations. The software engineering techniques are applied for the critical components specification of automated train control System. Initially graph theory is used to model the static components of system and then they are integrated with Z notation. The z notation is used to describe its entire state space. In this [5] the real topology is transferred to model topology by using the graph Theory. The switches and level crossing are then formalized. In the end, all these components are integrated to define the Railway Interlocking system.

This Research [6] is to develop a Mobile Application that can identify the road signs using camera of the mobile phone. Road signs which are focused by mobile Camera can be identified by using Image Processing Technique. Then, the proposed Application Delivered the full Information of road signs on user's mobile phone by using the Augmented Reality Technology. The results in Form of information can be delivered instantly with some specific rules, laws and regulations about the road sign. There are Several Road sign detection systems that are used to identify road signs and give the information for drivers while driving on the road. But the proposed application gives the results instantly using the concepts of augmented reality.

## **III.** CONCLUSION

This paper presented all idea to design an autopilot control system for train. This conclusion has been made after reviewing various research papers. The main objective of an autopilot control system is to prevent the train collision derailment. This paper deal with study set release. The emergency tracking and other operation.it also include the study of current developing situation and assessment method of urban railway track. Earlier, the AR is used for location finder for railway assistance where GPS and GLONASS increase the accuracy by 99.8%. The study also include that the quality of camera can be degraded in various climate conditions like fog and rain so RFID can be used. RFID is mainly used to gather data and information on the behavior monitored objects.

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