**Tracking prediction system in Ohio**

The Ohio Hub is a high-speed railway project proposed by the Ohio Department of Transportation aimed at revitalizing passenger rail service in the Ohio region.

Upon completion, the transit system would be composed of 860 mi (1,380 km) of track serving 32 stations. It would connect four states along with southern Ontario, consisting of 11 major metropolitan areas and 22 million people.

The system's goal is to "expand the capacity of the transportation system by improving the railroads for both freight and passenger trains."

The initial startup cost is currently projected to be in the $500 million range. This does not include the cost of trains or the preparations needed for high-speed service. Currently, two high-speed train systems are being explored. The first, a 79 mph (127 km/h) system, is expected to cost $2.7 billion, or $3.5 million per mile. The second option, a 110 mph (180 km/h) higher-speed system is estimated to cost $3.32 billion, or $4.5 million per mile.

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The project's hub will be based at Cleveland Hopkins International Airport (the state's largest and busiest airport) with a second Cleveland location near downtown Cleveland, and will provide service to adjacent cities in both the state of Ohio and the Ohio Region. Three proposals have been made for service – a single line system from Cleveland to Cincinnati, and two networked systems with multiple corridors providing service from Cleveland to various cities around the Ohio Region. Each corridor will branch out from Cleveland, and serve from four to nine stations, as well as connections to other regional rail services. Additional lines have been proposed to connect the currently planned corridors with each other throughout the state, as well as to add more stations between major cities.

**The best Idea :**

GPS And GSM

The train safety has been an issue with the increasing number of incidents being reported that has caused death and injury. Majority of deaths on the railway involve third parties with the incursion onto the level crossings. Average train accident would cost millions of Indian rupees and these can be avoided if there is a mechanism to track the train location and speed and warn the locomotive drivers about possible safety issues.

The solution is a comprehensive GPS/GSM based train tracking system, which provides accurate, dependable and timely information to the controller. The inbuilt GPS module identifies the train location with a highest accuracy and transfers the information of the central system GSM. the availability of this information allows the Train Controller to take accurate decisions as for the train location. Location data can be further processed to provide visual positioning using maps granting a wholesome vie won train location.

Positioning data along with train speed helps the administration to identify the possible safety issues and react to them effectively using the communication methods provided by the system. Additionally, this paper proposes a system which monitors the track in front of a train for obstacle detection using multi sensor setup. If an obstacle is detected, the inbuilt GPS module identifies the train location with a highest accuracy and transfers the information to the central system via GSM. The availability of this information allows the Train Controller to take accurate decisions as for the train location. latest information and communication technologies can provide effective and feasible solution for the requirement of are liable and accurate train tracking system to improve the efficiency and productivity of Indian Railways.

The solution we propose encompasses a powerful combination of mobile computing, Global System for Mobile Communication (GSM), Global Positioning System(GPS), Geographical Information System (GIS)technologies and software to provide an intelligent train racking and management system to improve the existing rail way transport service. All these technologies are seamlessly integrated to build a robust, scalable.

The fundamental process in our system is obtaining train on using GPS technology and transmitting the data via GSM network to the central control unit for data processing and information analysis and to take appropriate decision. The position data is periodically se no the central server through the GSM transmitter of the module.

The server automatically updates the data base with latest position, speed and direction information of each train The GPS receiver of the unit is capable of identifying the latitudinal and longitudinal position and ground speed of the specific train by receiving information from the GPS satellites. The device is capable of storing data in a buffer at a time of GSM connectivity failure, and can synchronize with the remote server when GSM is back online.

The device can also respond to commands and data calls from the central remote server as per administrative requirements of the train controller. The use of GSM over GPRS significant improves the feasibility and availability of our system. We have chosen GSM as the communication medium between the train locator and the central server to improve availability of our system by utilizing the existing GSM network which covers the whole country. The central control system includes are mote server for handling and processing all the position information received from train locators via the GSM network.

Our main objective is to avoid collision of trains and detecting objects on track fulfilling the fundamental requirement of reliable and real time in formation of train positioning for monitoring and administration purposes by t he Railway Department.

**Challenges :**

1. One of the reasons that can provoke serious accidents is the existence of obstacles on the tracks, either fixed or mobile. Paper proposes the combined use of diverse techniques of data fusion, based on fuzzy logic to validate the existence of objects, providing a highly reliable detection system .
2. Controlling the railway track geometry: surveying system is an alternative to classical geodetic measurement methods that are often used for controlling the railway track geometry. Track gauge, super-elevation, gradient, and track axis coordinates, which are railway geometrical parameters, can be instantly determined. Determining these information son time and taking precautions is important for the safety of railway systems .