SMART SOLUTION FOR RAILWAYS

Literature Survey:

HUM Industrial Technology – Predictive Monitoring & Fleet Tracking

Identification of wear and tear is crucial in any industry involving big machinery. In the railroad industry, in particular, failure of a single bearing leads to accidents that are preventable. Predictive monitoring solutions allow rail companies to remain a step ahead of the problem. Rail monitoring solutions increase the security of rail and also significantly cut costs arising from unexpected repairs.

The US-based startup HUM Industrial Technology offers predictive monitoring solutions to railroad shippers and railcar owners. The startup uses wireless Internet of Things (IoT) sensors for automated safety monitoring and prediction of wheel and bearing failure, as well as detection of oil or gas leakages. Moreover, the startup provides a live global positioning system (GPS) tracking solution that offers a comprehensive overview of fleet location and history. The startup helps rail operators reduce maintenance costs by enabling early detection of potential failures.

LIMMAT – Big Data & Analytics for Railways

Digitalization and the resulting utilization of big data pave the way for train communication and predictive analytics in the railway industry. By deploying smart railway sensors, millions of data points are gathered and analyzed to improve the safety, security, and reliability of railcars. The ability to predict failures further allows rail operators to plan repairs, thereby increasing the availability of rail. Startups are developing IoT sensors for almost every element of rail infrastructure, including railcars, tracks, and signaling units.

Spanish startup LIMMAT provides smart rail infrastructure solutions during the construction and operation stages. The startup offers its IMAS+ platform for predictive maintenance and condition-based maintenance (CBM). The platform combines IoT, big data, and machine learning (ML) to help railroad operators improve maintenance management and rail-fleet control. IMAS+ also helps reduce maintenance costs and increase fleet effectiveness and availability.

Visight Technology – Railways Security

A core concept of passenger rail is to safely deliver passengers from point to point. For that purpose, the industry continues to develop and adopt smart security systems to identify external risks and threats. For example, the luggage checking machinery helps with eliminating risks that arise from illegal activities such as trafficking. Modern improvements to such monitoring systems make transporting illegal objects and substances considerably more difficult.

Chinese startup Visight Technology offers security image recognition solutions to enhance the functionality of luggage scanning machines in rail transit. The startup provides a screenshot algorithm for smart identification of contraband. The algorithm is built using artificial intelligence (AI) combined with a large amount of security image data. Leveraging AI and image data, the startup provides services to rail transit operators to make rail security monitoring processes more efficient.

Planys Technologies – Underwater Bridge Inspection

Nowadays, even in remote areas, rail inspection can be carried out at lower costs using drones. However, the process becomes complicated when it comes to the underwater inspection of rail bridges. Since bridges are an important railways infrastructure element, emerging solutions aim to enable regular and thorough inspection. Therefore, startups develop underwater inspection solutions that allow rail operators to effectively manage critical rail infrastructure.

Indian startup Planys offers underwater robotics inspection solutions for several industries, including railroads. The startup uses a fleet of remotely operated vehicles (ROVs) that perform functions such as laser measurement, biofouling cleaning, and thickness gouging. The startup provides a cost-effective and time-saving solution to inspect the status of railroad structures underwater.

TRAINFO – Railroad Crossing Monitoring

Rail and road intersections often experience traffic delays, which affects the drivers in addition to hindering urban planning. Traffic delays at the railroad crossing, however, are avoidable with the effective use of IoT technologies. To this end, emerging rail startups provide smart devices and sensors to improve traffic congestion and safety at railway crossings.

Canadian startup TRAINFO provides a cost-effective solution to reduce traffic delays at railroad crossings. The start-up uses train sensors, Bluetooth, and prediction software to determine when to open and close rail crossings. This information is then conveyed through information systems, such as roadside signage, mobile apps, or traffic signal integration, to drivers. This solution also aids city planning officials when designing and operating railway crossings and other infrastructure.

One Big Circle develops Vehicle-borne Video Systems

Founding Year: 2017

Location: Bristol, UK

Innovate with One Big Circle for Smart Railway Track Monitoring

US-based startup One Big Circle builds vehicle-borne video systems. The startup combines advanced intelligent video review (AIVR) technology and machine learning to provide smart railway insights. Its

AIVR system captures railway surroundings and sends them to the cloud and further to a dashboard. The ML algorithms then analyze the raw data and provide valuable insights into electrical faults and broken railway tracks, among others. Thus, One Big Circle improves the overall safety of the railway transport industry and reduces maintenance costs.

Trainfo aids Railway Traffic Optimization

Founding Year: 2016

Location: Winnipeg, Canada

Funding: USD 180 000

Partner with Trainfo for Rail Crossing Blockage Information

Canadian startup Trainfo uses machine learning to optimize the traffic at railway crossings. The startup provides predictive rail crossing blockage information to manage traffic at the crossing. It re-routes traffic around blocked rail crossings and further, the information enables adaptive traffic signals to reduce congestion. This way, Trainfo allows traffic departments to avoid accidents at railway crossings and prevent traffic delays.

Hum enables Safe Railway Shipping

Founding Year: 2019

Location: St. Louis, US

Collaborate with Hum for Improved Railway Supply Chain

US-based startup Hum improves rail supply chain. The startup's platform uses machine learning-based predictive analytics and wireless technology in rail operations to provide live GPS data and the location history of railcar fleets. Its intelligent algorithms predict wheel and bearing failure months in advance and automatically detect leaks. This enables logistic operators to ensure safe railway shipping and predict failures to avoid disruptions.

Route Reports offers Railway Operational Intelligence

Founding Year: 2017

Location: London, UK

Funding: USD 4 M

Reach out to Route Reports for Railway Failure Prediction

UK-based startup Route Report provides railway operational intelligence. The startup uses artificial intelligence (AI) to provide real-time rail analytics. Route Reports' seasonal intelligence platform performs low-adhesion mapping to monitor network adhesion and seasonal treatment strategies. Its products allow transport bodies and rail operators to know exactly where, when, and why an adhesion event has occurred. Hence, the startup allows railway operators to reduce seasonal delays and improve operational efficiencies.

Rail Vision provides a Main Line System

Founding Year: 2016

Location: Ra'anana, Israel

Funding: USD 21 M

Partner with Rail Vision for Streamlined Railway Operations

Israeli startup Rail Vision advances railway vision through its mainline system that utilizes cognitive vision sensor technology and safety systems. The startup's product, Main Line System, enables trains to detect and classify objects on and along tracks from a distance of up to two kilometers in real-time, as well as in all weather and light conditions. It generates real-time visual and acoustic alerts for both the driver and the operator. This way, Rail Vision enables railway operators to streamline operations and enhance safety, reducing downtimes and accidents.