**INTRODUCTION**

Railway track identification is essential for maintaining the effectiveness and safety of railway networks. Traditional track identification techniques sometimes rely on time- consuming, costly hand examinations or specialized equipment. However, with advances in deep learning, it is now feasible to use computer vision algorithms to locate railway tracks automatically. In order to detect railway tracks using deep learning, a deep neural network must first be trained to recognize the visual patterns and attributes connected to railroad tracks. The model may be trained to detect the distinct features of tracks, such as their form, color, and texture, by supplying a dataset of annotated pictures or video frames in which the tracks are indicated with bounding boxes. Now a day, there is a deep learning method designated specifically for identifying railway tracks. Convolutional Neural Networks (CNNs), Region-based Convolutional Neural Networks (R-CNNs), and Fully Convolutional Networks (FCNs) are a few examples of deep learning architectures and algorithms that may be used for this job. It's important to keep in mind that selecting a deep learning approach relies on the particular needs, the available data, and the nature of the task of detecting railway tracks.

The applicability of different designs may be assessed in light of criteria like accuracy, efficiency, and real-time performance needs. Different architectures may have different strengths and limitations. Numerous studies have been conducted in this field, such as the investigation of the use of airborne LiDAR for track detection using deep learning networks [1], which propose a deep learning-based approach to accurately identify and locate railway tracks in LiDAR point cloud data, contributing to railway inspection and maintenance. Integrating LiDAR data and deep learning networks for railway track detection can potentially enhance railway maintenance, monitoring, and safety. It enables automated and real-time detection of track anomalies, such as track degradation, misalignments, or foreign object presence. This, in turn, can facilitate timely maintenance interventions, reduce inspection costs, and enhance overall railway operations.The potential of satellite imagery for track detection was highlighted by Li et al [2]. This research presents a method for railway track detection from high- resolution satellite images using deep learning techniques. The authors propose an approach that leverages deep neural networks to automatically identify and localize railway tracks, facilitating railway monitoring and management.

A deep learning-based method for detecting railroad tracks was presented by Chen et al. [3], who also discussed the use of deep learning networks for precise track detection. In order to automatically detect railway tracks. The results demonstrate the effectiveness of the deep learning-based approach in detecting railway tracks. The proposed method achieves high accuracy and provides reliable detection results. It outperforms traditional image processing methods and shows promise for improving efficiency and accuracy in railway track detection tasks. Also, Sun et al. [4] introduced an enhanced Faster R-CNN algorithm, highlighting the effectiveness and precision of the suggested approach. The approach consists of several key steps. First, image preprocessing techniques are applied to enhance the quality and contrast of the input images. Then, a region proposal network (RPN) generates potential track proposals in the image. The proposed RPN is optimized to improve track proposal accuracy and recall rate.