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A Deep Learning Approach for Road Pothole Detection Using Yolo V3

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ABSTRACT: Gangs are damage to the road with spaces that can cause serious road accidents and impair road efficiency. In this project, we propose a well-functioning pothole detection system that uses in-depth learning skills that can automatically find potholes in the streets. Four models are trained and tested with a pre-made database, including the YOLO V3, HOG with SVM (vector support machine). In the first stage, the first images with holes and non-hole areas are collected and labeled. In the two models are trained and tested for accuracy and loss of comparison with the image database processed. YOLO is an algorithm for the discovery of something famous for finding objects in images. This algorithm uses a single neural network to predict the vector of binding boxes and holes. This project uses YOLO V3; the training of this model is done in full pictures and class opportunities in the binding boxes. This method has more advantages than the original methods of acquisition of an object. Finally, the performance of both types is analyzed. Test results show that the YOLO V3 model performs very well in its fast and reliable acquisition results.

KEY WORDS: YOLO V3, Deep learning, Pothole detection, SVM

I. INTRODUCTION

Road travel was easy and cost-effective, although road conditions determine the comfort of travel. Roads on the roads are a major cause of distraction for motorists. They are caused by the increase and decrease in groundwater after the water enters the groundwater table. Criminals are thus becoming a major threat to drivers as they face accidents and injuries on the car. In 2017, India's Department of Road Transport and Highway reported 2,000 deaths related to potholes. The pits need to be repaired to make the trip more comfortable and to eliminate accidents. The task of repairing these pits is under the jurisdiction of the City Executive Council, but the current method of inspecting potholes and other illegal activities is by hand or by complaints registered by affected citizens. This makes it difficult to understand the seriousness and urgency of roads that need immediate attention if they are not available and notified to the authorities. The project reflects the work done on the database used by analyzing it and preparing it for the training phase. The database contains images from large input sources. Images from both sources provide various details of the adoption model training. YOLOv3, a discovery model to find holes is trained using a database. Focus also on creating the design of a system in which you can work to find holes. The aim is to provide a solution to the practical implementation of the manual acquisition of potholes through the municipal body. Create an in-depth learning model that can be used to find holes and visualize it on a map using an in-depth learning program. Images are provided with the model for finding holes to find holes. This information can be used by the NH team to repair pits.

II. RELATED WORK

1. Hsiu-Wen Wang, Chi-Hua Chen, Ding-Yuan Cheng A real-time pothole detection approach for intelligent transportation system

A real-time way to find a smart way to travel Various real-time pothole learning programs were studied to gain insight into the various algorithms and techniques used in them. The location of the pothole is an important factor. The spacing method is used to determine the exact location of the hole, the distance between the first point and the hole followed by the distance between the end point and the pothole is found using the GPS module on the cell phone. Define a hole detection system using an optical device installed in a car.



2. Seung-Ki Ryu, Taehyeong Kim, and Young-Ro Kim “Image-based pothole detection system for its service and road management system”,

This method uses a regional domain that is suitable for identifying a hole and is first categorized by various techniques such as Otsu, Histogram-based thresholding. The proposed system provided 73.5 percent accuracy with 80 percent accuracy, the location and size of the pit provided to the facility namely the mineral awareness service and the road management system.

3.Hsiu-Wen Wang, Chi-Hua Chen, Ding-Yuan Cheng, ChunHao Lin, and Chi-Chun Lo, “A real-time pothole detection approach for intelligent transportation system”,

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5.Sudarshan S Rode, Shonil Vijay, PrakharGoyal, Purushottam Kulkarni, and Kavi Arya, “Pothole detection and warning system: infrastructure support and system design”,

Imitation-based approach was developed by Sudarshan et al. build WiFi-enabled mobile nodes with a single intersection to inform drivers which means that mobile nodes about the pothole on the roads are available with software called Qualnet 4.0. Alert is sent via a package transfer from the access point to nearby locations to avoid collisions with RTS / CTS or CA

III. METHODOLOGY

Landscape is a method based on image shaping. It is often used in digital photography. Two important morphological functions are erosion and proliferation. Working with these methods facilitates the analysis of future forecasting data of pits in a particular region.

They are the most commonly used protocols like POP3 to receive emails. It also follows the client / server model. On the other hand, we have an IMAP client, which is a computer-based process. On the other hand, we have an IMAP server, which is a process that also works on another computer. Both computers are connected via a network.

1. IMAP is a client-client-protocol similar to POP3 and many other TCP / IP application processes. IMAP4 protocol only works when IMAP4 must remain on the server where the user's mailboxes are found. In c POP3 does not require the same visual server that provides SMTP services.

2. IMAP uses the Transmission Control Protocol (TCP) for communication to verify the delivery of data and findings respectively.

Integrated Development Environment (IDE) assists computer programmers by integrating basic tools (e.g., code editor, compiler, and debugging) into a single software package. Users do not need to install a language connector / interpreter on their devices; IDE provides the environment itself. Thonny is a free, dedicated Python IDE designed for beginners.

IV. EXPERIMENTAL RESULTS

Thus the result shows the road pathole detection using yolov3. The image processing technique can be implemented successfully in thonny software. Here the SVM algorithm can be used for road pathhole detection , if road path hole detected means automatically send image notification to NH team for fast road repair.so thus our project can be easily avoide road accident.

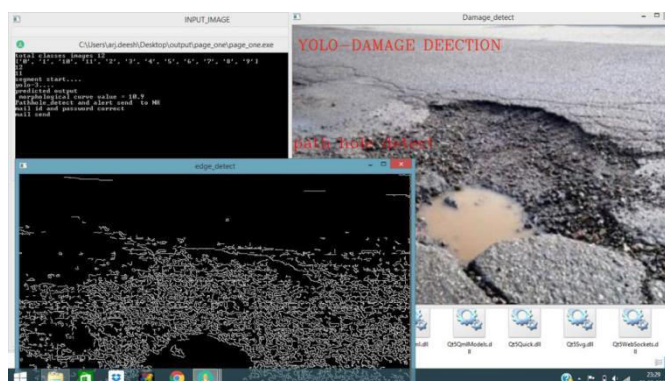


Figure no: 1 Road path hole detection.

V.CONCLUSION

This pothole detection system and online warning system provides emergency responders with as much information as possible in the first instance. Reducing the time between when an accident occurs and when it is detected can reduce mortality rates. All functions must be integrated with the vehicle to ensure its operation and reliability. Therefore, this work will reduce the number of fatal accidents by a large amount even on rural roads. After that it is very important in the daily life of the people in a country like India. The proposed project will provide important information on the road even in restricted areas. Therefore, this work ensures a reduction in the mortality rate and mortality in a country like India and which will also have a significant impact on daily life.

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