

# Abstract

Potholes are among the major sources of road accidents, damage to vehicles, and disruption in road traffic. Manual inspection of roads for potholes often turns out to be slow and inefficient; thus, an automated pothole detection system is considered highly beneficial. The present paper offers a practical solution to detect potholes in real time and help drivers avoid them. In this context, a camera and infrared sensors may be connected through a Raspberry Pi module to capture images of the road surface and detect any irregularities on them. The captured data are processed using Python-based image processing with OpenCV and TensorFlow, enabling the accurate identification of potholes through machine learning models. After recognizing a pothole, the model will alert the driver and will make a safe steering suggestion along with reducing the speed of the vehicle automatically in order to avoid any potential damage to the vehicle. All the detection results are stored in a local or cloud database for later analysis in road quality and maintenance planning. The idea integrates concepts of computer vision, IoT, and automation, making road driving safer and smarter.

Here is the link to the research paper :- [ResearchPaper](#)