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ABSTRACT:

Indian Railways is the largest railway network in Asia and additionally world's second largest network operated underneath a single management. Due to its large size it is difficult to monitor the cracks in tracks manually. This paper deals with this problem and detects cracks in tracks with the help of ultrasonic sensor attached to moving assembly with help of stepper motor. Ultrasonic sensor allows the device to moves back and forth across the track and if there is any fault, it gives information to the cloud server through which railway department is informed on time about cracks and many lives can be saved. This is the application of IoT, due to this it is cost effective system. This effective methodology of continuous observation and assessment of rail tracks might facilitate to stop accidents. This methodology endlessly monitors the rail stress, evaluate the results and provide the rail break alerts such as potential buckling conditions, bending of rails and wheel impact load detection to the concerned authorities.

KEYWORDS: IOT, Raspberry, Smart railway, Fault detection, Ultrasonic sensor.

INTRODUCTION:

Internet is basically system of interconnected computers through network. But now its use is changing with changing world and it is not just confined to emails or web browsing. Today's internet also deals with embedded sensors and has led to development of smart homes, smart rural area, e-health care's etc. and this introduced the concept of IoT. Internet of Things refers to interconnection or communication between two or more devices without human-to-human and human-to-computer interaction. Connected devices are equipped with sensors or actuators perceive their surroundings. IOT has four major components which include sensing the device, accessing the device, processing the information of the device, and provides application and services. In addition to this it also provides security and privacy of data. Automation has affected every aspect of our daily lives. More improvements are being introduced in almost all fields to reduce human effort and save time. Thinking of the same is trying to introduce automation in the field of track testing. Railroad track is an integral part of any company's asset base, since it provides them with the necessary business functionality. Problems that occur due to problems in railroads need to be overcome. The latest method used by the Indian railroad is the tracking of the train track which requires a lot of manpower and is time-consuming.

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EXISTING SYSTEM:

Existing train tracks are manually researched. LED (Light Emitting Diode) and LDR (Light Dependent Resister) sensors cannot be implemented on the block of the tracks]. The input image processing is a clamorous system with high cost and does not give the exact result. The Automated Visual Test Method is a complicated method as the video color inspection is implemented to examine the cracks in rail track which does not give accurate result in bad weather. This traditional system delays transfer of information. Srivastava et al., (2017) proposed a moving gadget to detect the cracks with the help of an array of IR sensors to identify the actual position of the cracks as well as notify to nearest railway station. Mishra et al., (2019) developed a system to track the cracks with the help of Arduino mega power using solar energy and laser. A GSM along with a GPS module was implemented to get the actual location of the faulty tracks to inform the authorities using SMS via a link to find actual location on Google Maps. Rizvi Aliza Raza presented a prototype in that is capable of capturing photos of the track and compare it with the old database and sends a message to the authorities regarding the crack detected. The detailed analysis of traditional railway track fault detection techniques is explained in table.

FUTURE SCOPE:

In future CCTV systems with IP based camera can be used for monitoring the visual videos captured from the track. It will also increase security for both passengers and railways. GPS can also be used to detect exact location of track fault area, IP cameras can also be used to show fault with the help of video. Locations on Google maps with the help of sensors can be used to detect in which area track is broken.

CONCLUSION:

Accidents occurring in Railway transportation system cost a large number of lives. So this system helps us to prevent accidents and giving information about faults or cracks in advance to railway authorities. So that they can fix them and accidents cases becomes less. This project is cost effective. By using more techniques they can be modified and developed according to their applications. By this system many lives can be saved by avoiding accidents. The idea can be implemented in large scale in the long run to facilitate better safety standards for rail tracks and provide effective testing infrastructure for achieving better results in the future.

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REFERENCES:

- 1. D. Hesse, "Rail Inspection Using Ultrasonic Surface Waves" Thesis, Imperial College of London, 2007.
- 2. Md. Reya Shad Azim1, Khizir Mahmud2 and C. K. Das. Automatic railway track switching system, International Journal of Advanced Technology, Volume 54, 2014.
- 3. S. Somalraju, V. Murali, G. saha and V. Vaidehi, "Title-robust railway crack detection scheme using LED (Light Emitting Diode) LDR (Light Dependent Resistor) assembly IEEE 2012.
- 4. S. Srivastava, R. P. Chourasia, P. Sharma, S. I. Abbas, N. K. Singh, "Railway Track Crack detection vehicle", IARJSET, Vol. 4, pp. 145-148, Issued in 2, Feb 2017.
- 5. U. Mishra, V. Gupta, S. M. Ahzam and S. M. Tripathi, "Google Map Based Railway Track Fault Detection Over the Internet", International Journal of Applied Engineering Research, Vol. 14, pp. 20-23, Number 2, 2019.
- 6. T. Wang, F. Yang, K-L. Tsui, "Real-Time Detection of Railway Track Component via One-Stage Deep Learning Networks". Sensors, 20, 4325, 2020.
- 7. R. A. Raza, K. P. Rauf, A. Shafeeq, "Crack detection in Railway track using Image processing", IJARIIT, Vol. 3, pp. 489-496, Issue 4, 2017.
- 8. S. Ramesh, "Detection of Cracks and Railway Collision Avoidance System", International Journal of Electronic and Electrical Engineering ISSN 0974- 2174 Volume 4 (3), pp. 321-327, 2011.
- 9. N. Bhargav, A. Gupta, M. Khirwar, S. Yadav, and V. Sahu, "Automatic Fault Detection of Railway Track System Based on PLC (ADOR TAST)", International Journal of Recent Research Aspects, Vol. 3, pp. 91-94, 2016.
- 10. S. Mishra, A. Shrivastava and B. Shrivastav, "A Smart Fault Detection System For Indian Railways", International Journal of Scientific & Technology Research, 2019.
- 11. B. Siva Rama Krishna "Railway Track Fault Detection System by Using IR Sensors and Bluetooth Technology", Pragati Engineering College, East Godavari, Andhra Pradesh, India, 2017.
- 12. M. Banupriya, R. Subashini, S. Suganya, D. S. Vinothini, M. Priyadarshini, "Self Powered For Railway Track Monitoring Using IoT", IOSR Journal of Engineering (IOSR JEN), 2019.
- 13. A. Parvathy, M. G. Mathew, "Automatic Railway track fault detection for Indian railways", International Conference on Communication and Electronics Systems, IEEE, 2017.
- 14. M. R. Sarwan, A. S. Sonawane, P. Chowdhary and S. M. More, "Automated Railway Track Fault Detection System Using Robot", International Conference on New Frontiers of Engineering, Management, Social Science and Humanities, 2018.
- 15. S. D. Patil, P. M. Taralkar, "Train Track Fault Detection System", Technical Research Organization India, 2018.