IoT Based Visual Defect Detection in Railway Tracks

A. Geethanjali[1], T. Vijitha[2], S. Naveen Kumar[3], D. Gajendran[4], U. Thulasi Ram[5], N. Moulika[6]

Associate Professor, Department of Electronics and Communication Engineering[1]
UG Students, Department of Electronics and Communication Engineering[2,3,4,5,6]
Sri Venkatesa Perumal College of Engineering and Technology, Puttur, AP, India

Abstract: *This paper proposes the design of crack finding robot in the railway tracks. In India rail transportation engage a major pose in asset with the essential transportation to maintain necessities of a briskly emergent financial system. At present, India possesses the 4th major railway network in the globe.It has proven inappropriate for the control system currently use in Indian railways. Therefore, there is a need to have new technology which will be vigorous, well organised and stable for both crack detection in railway track as well as object or things detection. A robust monitoring system has been suggested and clarified in this paper to address the shortcomings of the existing rail surveillance system to detect cracks of the railway tracks. To detect cracks & damages in railway tracks. To design & develop IoT enabled Robo. To inform Railway Controller about cracks & damaged track information when detected by the robot. To send all the information through wireless communication based devices. Designing the project to overcome this problem.*

Keywords: Crack Identification, Ultrasonic Sensors, Node MCU ESP8266 Wi-Fi Module, Safety Management, GPS Sensor, Railway Supervision

REFERENCES

[1]. A. Rizvi, P. Khan and D. Ahmad, "Crack Detection In Railway Track Using Image Processing", International Journal of Advance Research, Ideas andInnovations in Technology., vol.3, no. 4, 2017.

[2]. Gokula Chandar ,Leeban MosesM; T. Perarasi M; Rajkumar; "Joint Energy and QoS-Aware Cross-layer Uplink resource allocation for M2M data aggregation over LTE-A Networks", IEEE explore, doi:10.1109/ICAIS53314.2022.9742763.

[3]. Mustafa Alper Akkaş, Radosveta Sokullu, "An IoT-based greenhouse monitoring system with Micaz motes", https://doi.org/10.1016/j.procs.2017.08.300.

[4]. P. V. Vimal and K. S. Shivaprakasha, "IOT based greenhouse environment monitoring and controlling system using Arduino platform," 2017 International Conference on Intelligent Computing, Instrumentation and Control Technologies (ICICICT), Kannur, 2017, pp. 1514-1519.

[5]. Dhuddu Haripriya, Venkatakiran S, Gokulachandar A, "UWB-Mimo antenna of high isolation two elements with wlan single band-notched behavior using roger material",Vol 62, Part 4, 2022, Pg 1717-1721, https://doi.org/10.1016/j.matpr.2021.12.203.

[6]. Gokula Chandar A, Vijayabhasker R., and Palaniswami S, "MAMRN – MIMO antenna magnetic field", Journal of Electrical Engineering, vol.19, 2019.

[7]. Rukkumani V , Moorthy V, Karthik M , Gokulachandar A, Saravanakumar M, Ananthi P, "Depiction of Structural Properties of Chromium Doped SnO2 Nano Particles for sram Cell Applications", Journal of Materials Today: Proceedings, vol.45, pp.3483-3487, 2021. https://doi.org/10.1016/j.matpr.2020.12.944.

[8]. Avinash. V. animireddy and D. Aruna Kumari "Automatic Broken Track Detection Using LED-LDR Assembly" in International Journal of Engineering Trends and Technology (IJETT), - July 2013, pp. 289-292.

[9]. Ch. Muneendra Rao , B. R. Bala Jaswanth and Ch.Muneendra Rao " Crack Sensing Scheme in Rail TrackingSystem" in Int. Journal of Engineering Research andApplications, January 2014, pp. 13-18.

[10]. R.V.K. Charan "Early detection & alarming of a transversecrack in a railway track (modified)", International Journal of Scientific & Engineering Research, January-2013, pp. 234-241.

[11]. S. Ramesh,"Detection of Cracks and Railway Collision Avoidance System",International Journal of Electronic and Electrical Engineering, January-2011, pp. 321-327.

[12]. L. Dan, C. Xin, H. Chongwei and J. Liangliang, "Intelligent Agriculture Greenhouse Environment Monitoring System Based on IOT Technology," International Conference on Intelligent Transportation, Big Data and Smart City, Halong Bay, 2015, pp. 487-490.

[13]. S.Kannadhasan and R,Nagarajan, Performance Improvement of H-Shaped Antenna With Zener Diode for Textile Applications, The Journal of the Textile Institute, Taylor & Francis Group, DOI: 10.1080/00405000.2021.1944523

[14]. N. Hassan, S. I. Abdullah, A. S. Noor and M. Alam, "An automatic monitoring and control system inside greenhouse," 3rd International Conference on Green Energy and Technology (ICGET), Dhaka, 2015, pp. 1-5

[15]. Q. Bai and C. Jin, "The Remote Monitoring System of Vegetable Greenhouse," 10th International Symposium on Computational Intelligence and Design (ISCID), Hangzhou, 2017, pp. 64-67.

[16]. L. Lu, L. Qin, Shi Chun and G. Wu, "Design and implementation of modern greenhouse remote monitoring system based on web," Proceedings of the 32nd Chinese Control Conference, Xi'an, 2013, pp. 6660-6663.