

U S H A I R A M A

COLLEGE OF ENGINEERING AND TECHNOLOGY

AUTONOMOUS

Approved by AICTE and Permanently Affiliated to JNTUK, Kakinada

NH-16, Telaprolu, Ungutur Mandalam, Near Gannavaram,

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Department of Electronics and Communication Engineering

Registration for B.Tech Main Project Work

Academic Year: 2025-26

Date:18/8/2025

Batch.No.: C11

Name of the Student(s) along with Roll No.(s):

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|-----------------------------|------------|
| 1. KATAMGARI SRIVALLI PADMA | 23NG5A0410 |
| 2. GARRE JAYASRI | 22NG1A04F3 |
| 3. BATNAVALLI SUBHASH | 23NG5A0402 |
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Broad area of proposed project work: Embedded System

Title of the proposed project work: Smart Steering Wheel: Design of IoMT-Based Non-Invasive Driver Health Monitoring System to Enhance Road Safety

Abstract of the proposed work:

The integration of Internet of Things (IoT) technology and medical devices in healthcare is termed the Internet of Medical Things (IoMT). This advancement holds promise for numerous applications aimed at mitigating the risk of loss of life through physiological signal monitoring. As the number of road accidents is rapidly increasing, a substantial number of car crashes occur due to medical conditions. Therefore, the need remains to develop an effective solution to enable the prevention of such accidents for enhanced road safety. Unlike existing approaches, this paper proposes a holistic IoMT-based non-invasive driver health monitoring system (DHMS) to monitor important vital signs for detecting abnormal health conditions. The proposed system consists of an embedded system, edge computing, cloud computing, and a mobile application with an alert system, to offer an end to-end unified solution for driver physiological signal monitoring to detect abnormal health conditions that might lead to a road accident. The system is particularly suited to aid (elderly) people with medical conditions and can also be used for public transport to ensure passenger safety. A detailed experimental evaluation of the

proposed system has been performed and its performance accuracy compared with standard medical devices, along with quality factors including usability, portability, and effective sensor placement.

Implementation tools required (Hardware/software):

Software tool:

- 1.Arduino IDE
- 2.Keil uVision
- 3.Matlab

Hardware required:

- 1.Raspberry Pi 4
- 2.Arduino Nano

References:

1. B. Pradhan, S. Bhattacharyya, and K. Pal, “IoT-Based Applications in Healthcare Devices,” Journal of Healthcare Engineering 2021 (2021): 1–18, <https://doi.org/10.1155/2021/6632599>.
2. S. Kumar, P. Tiwari, and M. Zymbler, “Internet of Things Is a Revolutionary Approach for Future Technology Enhancement: A Review,” Journal of BigData6,no.1 (December2019):1–21, <https://doi.org/10.1186/S40537-019-0268-2/FIGURES/9>.
3. A. A. Akintunde, T. Sade Akintunde, and O. G. Opadijo, “Knowledge of Heart Disease Risk Factors Among Workers in a Nigerian University: A Call for Concern,” Nigerian Medical Journal 56, no. 2 (2015): 91, <https://doi.org/10.4103/0300-1652.150688>.
4. “Cardio vascular Diseases (CVDs),” World Health Organization, accessed March 01, 2023, [https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds))
5. “Noncommunicable Diseases,” World Health Organization, accessed March 01, 2023, <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>

Signature of the students

Remarks by the Supervisor:

Signature & Name of the Supervisor with date

Signature of Class Teacher with date

Signature of HoD with date