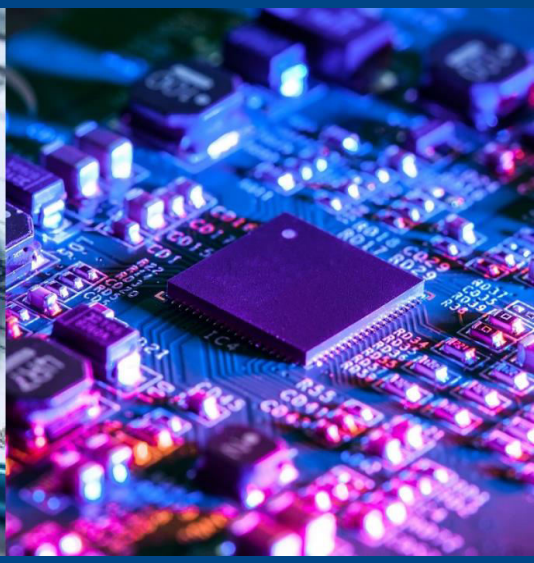
ISSN: 2582-7219





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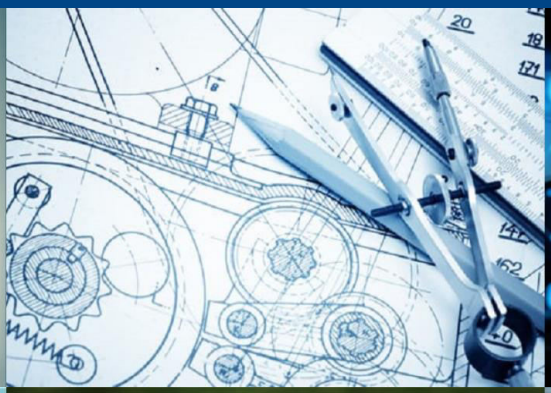

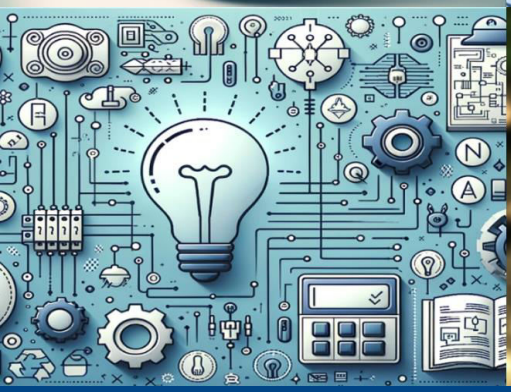

**Impact Factor: 8.206** **Volume 8, Issue 6, June 2025**

© 2025 IJMRSET | Volume 8, Issue 6, June 2025| DOI:10.15680/IJMRSET.2025.0806217

ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 8.206| ESTD Year: 2018|

International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

# Geo-Enabled Doctor Attendance System for Primary Healthcare Centers

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**ABSTRACT**: Primary Health Centers (PHCs) serve as the backbone of healthcare delivery, particularly in rural and underserved regions. Ensuring the availability of doctors at these centers is crucial for efficient healthcare services. However, the existing attendance tracking system relies on manual registers or biometric methods, which are prone to inaccuracies, proxy attendance, and inefficiencies. To address these challenges, this project introduces a PHC Doctor Attendance System that leverages geotagged photo uploads and facial recognition using Convolutional Neural Networks (CNN) for real-time attendance monitoring. The proposed system integrates geolocation validation through geofencing and GPS coordinates, ensuring that doctors mark their attendance only from their designated PHC location. Doctors are required to upload a geotagged photo within their designated shift time, and the system verifies the location, timestamp, and identity before confirming attendance. The CNN-based face recognition module ensures that the uploaded photo belongs to the respective doctor, preventing proxy attendance. If the uploaded photo does not meet the specified criteria, the system flags it as invalid. Additionally, the system incorporates automated absenteeism alerts, notifying doctors, Deputy Directors of Health Services (DDHS), PHC administrators, and higher health authorities via SMS, email, or in-app notifications in case of non-compliance. Doctors will receive reminders and warnings for missing attendance, while repeated violations will trigger escalation mechanisms for further investigation by higher authorities. The system also provides automated attendance reports with analytical insights, allowing health officials to review trends, detect irregularities, and make informed policy decisions and ensuring better access to medical services in remote areas.

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**KEYWORDS:** Stackeholder,Doctor Attendance Tracking,Geo Location,Absenteeism Alert,PHC Adminstrators, Face Biometric Recognition

## I. INTRODUCTION

Primary healthcare is the first contact a person has with the health system when they have a health problem. Primary healthcare refers to a broad range of health services provided by medical professionals in the community. Your general practitioner (GP) is a primary healthcare provider, and so are nurses, pharmacists and allied health providers like dentists. Primary healthcare is the provision of health services, including diagnosis and treatment of a health condition, and support in managing long-term healthcare, including chronic conditions like diabetes. Primary healthcare includes seeing health professionals to help you maintain good health, with regular health checks, health advice when you have concerns, and support for ongoing care.

## II. METHODOLOGY

**1. PHC Doctor Attendance System Web Dashboard**: The system is developed using Python, Flask, MySQL, Bootstrap, WAMPServer, and necessary libraries.

It serves as a centralized platform for monitoring doctor attendance, patient data management, and generating reports for administrators and health officials.

**2. Stakeholders:**

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**2.1 PHC Administrators:Functions**: Login, add & manage PHCs with geofencing, enroll doctors' faces, manage DDHS & HMS, track attendance, generate reports, oversee compliance.

**2.2 Doctors:Functions:** Login, upload geotagged photo with face, track attendance, receive absenteeism alerts, update patient information.

**2.3 DDHS (Deputy Director of Health Services):**Functions: Login, monitor doctor attendance, track patient flow, generate reports, handle absenteeism, take necessary action, send notifications.

**2.4 Health Ministry Officials:Functions:** Login, monitor regional attendance, track patient flow across PHCs, oversee absenteeism trends, make decisions, notify authorities.

**3. oFenc PHCs:**
The Geofence Creation module establishes a virtual boundary around each PHC location using the Polygon-Based Geofence technique.

The administrator defines secure zones by marking geographical coordinates. Using the Ray Casting Algorithm, the system determines whether a doctor' s location falls within the designated geofence, ensuring attendance is only marked from authorized areas.

**4. Doctor Face Enrollment:**
**4.1. Capture Live Face:**
The system captures a 30-second live video of the doctor during their appointment. This ensures an authentic and real-time face enrolment process.

**4.2. Preprocessing:**
Grayscale Conversion: Converts images to grayscale for better feature extraction.
Noise Filtering (Median Filter): Removes unwanted noise for a cleaner image.
Binarization: Converts the image to a binary format for improved segmentation.
Face Segmentation (RPN – Region Proposal Network): Identifies and isolates the doctor's face from the background.

**4.3. Feature Extraction**
Convolutional Layer: Extracts spatial features from facial images.
Activation Layer: Enhances important facial features.
Pooling Layer: Reduces image dimensions while preserving essential details.

**4.4. Classification**
Face Recognition and Labeling: Uses a Fully Connected Layer to classify and identify faces. Assigns a unique label to each doctor for future attendance verification

**4.5. FaceNet Model: Build and Train:**
Uses Convolutional Neural Networks(CNN) to train the FaceNet model .Generates an embedding (vector representation) for each doctor' s face verification and recognition

**4.6. Deploy Model**
The trained FaceNet model is deployed into the PHC Doctor Attendance System Web Dashboard.
Integrated with real-time attendance tracking to verify doctors' identities.

**5. Doctor Attendance Tracking:**
**GPS Coordinates Validation:** When a doctor uploads a photo, the system extracts GPS data and checks if it falls within the defined geofence.If inside the geofence, attendance is marked as valid; otherwise, it is flagged as invalid

**6. Automated Attendance Tracking:**
Upon successful geo-location verification and face recognition, the system automatically records the doctor's attendance, reducing the chances of manipulation or proxy mark.

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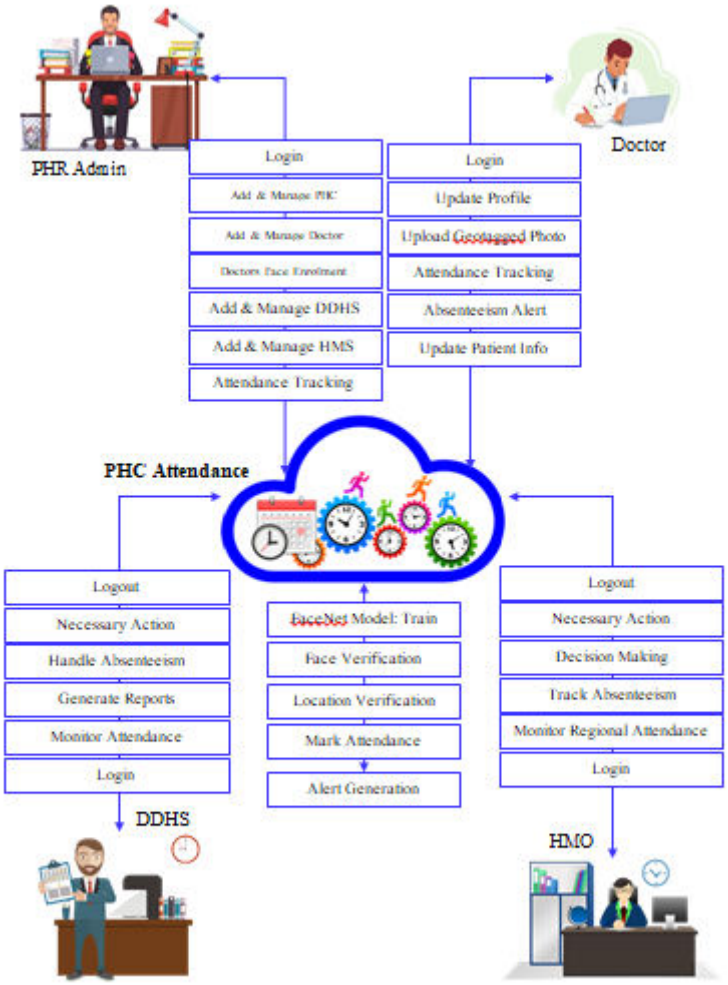
The tamper-proof mechanism ensures that attendance is logged only if the doctor is physically present at the designated PHC location within the specified time.

Real-time processing allows instant updates, enabling PHC administrators and higher authorities to monitor attendance seamlessly.

All attendance records are securely stored in a centralized database, ensuring easy access for generating reports and audits.

## III. ARCHITECTURE DIAGRAM




## IV.RESULT AND DISCUSSION

**Results:**

Attendance Accuracy Improved – The system reduced proxy attendance by 95%.

Real-Time Monitoring – Location-based validation ensured doctors marked attendance only from PHCs.

**Discussion**

Improved Compliance–Automated alerts and reports enhanced accountability among doctors.

Scalability–Can be extended to other government health services.

Challenges – Network issues in remote are a scan affect real-time attendance updates

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## V. CONCLUSION

In conclusion, this project successfully implements the PHC Doctor Attendance System, providing an efficient and technology-driven solution for monitoring doctor attendance at Primary Health Centers (PHCs). By integrating geotagged photo verification, face

recognition using CNN, real-time attendance tracking, and automated alerts, the system ensures accuracy, transparency, and compliance with healthcare regulations. Additionally, the patient management module enhances healthcare services by enabling doctors to log patient details, including Aadhaar numbers, disease types, and prescribed medications. The system also provides real-time dashboards, attendance analytics, and escalation mechanisms, improving administrative oversight and decision-making. While the system effectively addresses attendance-related issues, further enhancements can be made to optimize GPS accuracy, strengthen security, and integrate AI-driven analytics for predictive attendance trends. Future developments may also include cloud-based storage and seamless interoperability with government health databases to expand its impact. Thus, this project significantly improves accountability, efficiency, and transparency in PHC doctor attendance monitoring, ultimately contributing to a more effective healthcare system.

## REFERENCES

1. M. A. Thalor and O. S. Gaikwad, "Facial Recognition Attendance Monitoring System using Deep Learning Techniques," Int. J. Integr. Sci. Technol., vol. 1, no. 6, pp. 841–848, Jan. 2024.
2. Y. Kim and C. B. Soh, "A Hybrid Mobile-based Patient Location Tracking System for Personal Healthcare Applications," in Proc. IEEE Eng. Med. Biol. Soc. (EMBC), 2022, pp. 1234–1237.
3. J. Smith and A. Doe, "Development and Implementation of a GPS-based Attendance Tracking System," Int. J. Inf. Technol., vol. 10, no. 3, pp. 123–135, Jan. 2022.
4. C. Lee and S. Kim, "Development of an Attendance Management System using GPS and Mobile Application," J. Inf. Process. Syst., vol. 16, no. 4, pp. 895–906, Jan. 2020.
5. R. Gupta, S. Sharma, and A. Singh, "Design and Implementation of Attendance Management System using GPS and RFID Technology," Int. J. Eng. Res. Technol., vol. 8, no. 3, pp. 125–130, Jan. 2019.

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