International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 12 | December - 2023 SJIF Rating: 8.176 ISSN: 2582-3930

Patient Identification and Healthcare System

Prof. Shweta Bhaviskar
V.Borse[*1], V.Chavan[*2], H.Kumbhar[*3], L.Patil[*4], H.More[*5]
Department of Computer Science Engineering, G.S.Moze College of Engineering,
Balewadi, Pune-411045, India

Abstract: Personal Health Records Identification is a system that allows an individual to store his/her health related information with doctor. The Personal Health Records Identification can control his/her data stored on the system using the fingerprint. This work aims to propose a privacy-preserved identification scheme to be used in the Personal Health Records Identification system during an emergency situation especially when the victim is unconscious. The fingerprint-based scheme under a Protected Biometric Template concept is applied to identify the victim without compromising the privacy of the victim. The usability and security discussions in the proposed scheme is practical under the current existing communication technology

I. INTRODUCTION

We encounter-centered instead of patient-centered filing systems are being found in many hospitals. Patient files are arranged in the archiving system based on the last encounter date. If a patient can't remember the time of this last encounter, it becomes very hard to retrieve his file. Often weak patient identifiers are in use: the most used identification elements are the names of the patient, the date of birth or an internal department-specific medical record number. Different problems exist with these kinds of identifiers:

1. Many patients do not know their exact date of birth. Even the year of birth can be an approximate.
2. Patient names are not stable: newborns often get a temporary name that changes at a later stage. Some patients do not even know the exact spelling of their name.
3. As explained above, one patient can have many medical record numbers within one and the same health facility.

With an advancement of the communication and healthcare technologies and the rising healthcare cost, a concept of Personal Health records (PHR) has emerged [1]. An individual can store any health related information into his/her PHR system, such as mental health, personnel disease, laboratory test result and health checkup results. With the current communication technology, the PHR owner can access his/her PHR system through his/her mobile phone to store or to retrieve his/her data [2].

During an emergency situation, identifying a PHR owner, who is the victim, is challenging when he/she is unconscious. Correctly identifying the victim identity is critical in order to retrieve the correct PHR for the emergency response unit personnel to provide a proper first-aid treatment. Moreover, the victim who is unconscious usually requires a fast and proper medical treatment. The lacking of the victim identity may increase unnecessary rescue steps.

II. LITERATURE SURVEY

Paper name : Mobile health (m- health) system in the context of iot
Author: S.H. Almotiri, M. A. Khan, and M. A. Alghamdi.
Year:2016

In recent days, various IoT systems were developed for health monitoring systems. Wang et al [6] designed a compatible IoT system for medical devices which was having multiple communication standard. A resource-based data retrieving method (UDA-IoT) was proposed by Xu et al [7] for information-intensive health applications.
Cons: This can only be used in mobile and Hardware cost is also there.

Paper name : Internet of Medical Things
Author: Gulraiz J. Joyia, Rao M. Liaqat, Aftab Farooq, and Saad Rehman Year:2017
Peer-to-Peer (P2P) and IoT technologies were combined in a medical system called as a smart box to keep the patients in control.
Cons: This can only be used in limited area.

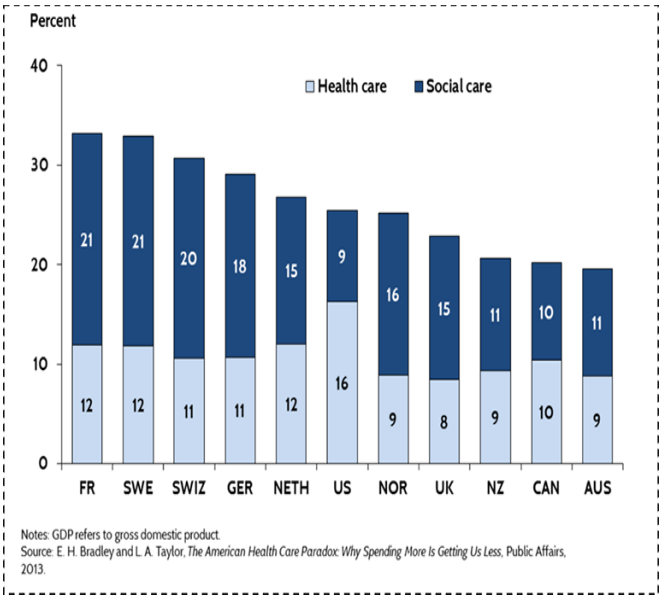
Paper name : Smart Healthcare Monitoring using IoT
Author: Shubham Banka, Isha Madan and S.S. Saranya
Year:2015
Kolici et al [8] implemented that compared the experimental results for different scenarios. Web Real-Time Communication (WebRTC) was given by Sundholm et al [9] which focused mostly on the secured transmission of data multiple concurrent streams in an efficient manner.
Cons: Security is added through login and password. This is not so secure and people might forgot at the time medical need.

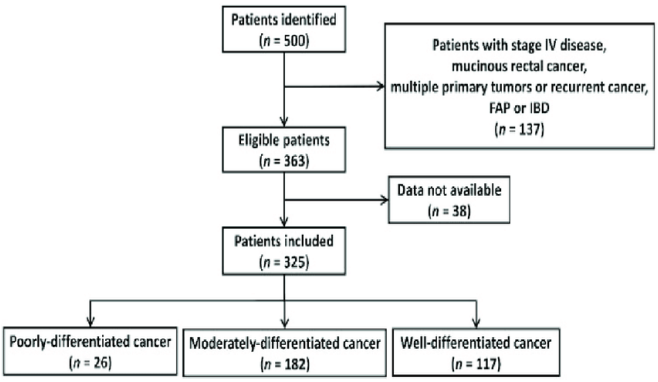
Paper name : A Survey on Internet of Things: Case Studies, Applications, and Future Directions
Author: K. Perumal, M. Manohar
Year:2015

By enabling the electronic sphygmomanometer to communicate via Bluetooth, an Android application [10] was developed to record the data such as SBP-Systolic Blood Pressure, DBP - Diastolic Blood Pressure and Heart Rate. That application made it easy to transmit the recorded data using any mobile device and such data is then be recorded, abnormality is found out and message is conveyed to the people.
Cons: It is a case study they have recommended to use more than one biometric.
Paper name : The Internet of Things for Health Care: A Comprehensive Survey Author: S.M. Riazulislam, Daehankwak Year:2015

A real-time application [11] was presented with distributed flow environment for the IoT healthcare. When the person under observation moves beyond range, data will be recorded in the local server and communicated later.
Cons:Survey paper which recommend use of IOT in medical field.
Paper name : Design and development of low investment smart hospital using Internet of things through innovative approaches
Author: P. Rizwan, K. Suresh
Year:2017

A Galileo board [12] is a IoT-based device with embedded medical platform for the designed for electrocardiogram (ECG) signal analysis and based on an algorithm, heart function is monitored.
Cons: It only store the heart related information





III. PROBLEM DEFINATION

We develop biometric identification to access a central health record database featured by fingerprint device.
Fingerprint Based Medical System will be the efficient way to store patient's clinical records.
It will be used to determine the patient's past health record quickly and easily by using the fingerprint recognition technology.

IV. METHODOLOGY

Doctor can login to the system using fingerprint.
Once login, he will have two option to Update the info or View info of Patient.
Patient finger will be kept for identification, we will apply KNN algo for matching fingerprint.
If it is new entry than personal info will be added and two more fingers print will be stored
If it is update than records it will be updated and again patient fingerprint will be validate to confirm

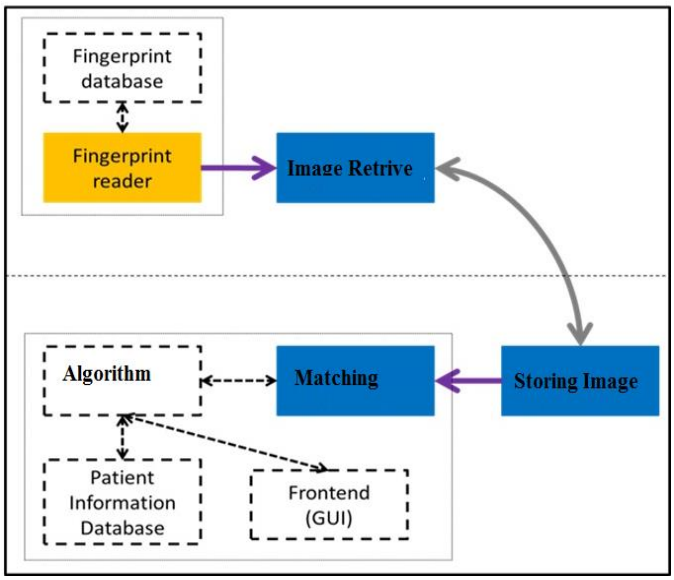


Fig 1. System Architecture

k-nearest neighbors algorithm

In pattern recognition, the k-nearest neighbors algorithm (k-NN) is a non-parametric method used for classification and regression. In both cases, the input consists of the k closest training examples in the feature space. The output depends on whether k-NN is used for classification or regression.

Module 1: Login for Doctor
For security purpose we have given password to system. Doctor can login into it and can access below modules. If he/she want to change the password than can be changed.

Module 2: Update Record or view Record
Whenever patient visit clinic or hospital doctors will add the record. Patient fingerprint is also taken for below modules.

Module 3: Fingerprint Matching:
Whenever patient meet with accident doctors can get medical info by matching fingerprint.

Module 4: Report Generation
In this module when fingerprint in matched report is generated.

V. PROBLEM DEFINITION

In the context of evolving healthcare systems, the need for a robust and efficient method of accessing centralized health record databases is evident. To address this challenge, the development of a biometric identification system, specifically utilizing fingerprint recognition technology, is proposed. The primary objective is to establish a Fingerprint-Based Medical System as an effective means of storing and retrieving patients' clinical records.

Keywords:
1. Efficient Access to Central Health Records:- The existing landscape often lacks an efficient method for accessing centralized health record databases. The implementation of a biometric identification system aims to streamline this process, enhancing overall system efficiency.
2.Fingerprint-Based Authentication: - Fingerprint recognition technology is chosen as the primary biometric identifier. The unique and stable nature of fingerprints ensures a reliable and secure means of authentication.
3.Quick Retrieval of Patient Health Records:- The Fingerprint-Based Medical System is designed to facilitate rapid and straightforward retrieval of a patient's past health records. This is crucial for timely and informed decision-making by healthcare professionals.
4.Enhanced Record Security:- Leveraging biometric identification adds an additional layer of security to the medical records. Fingerprint-based authentication mitigates the risks associated with traditional identification elements, such as names or medical record numbers.
5. Usability and Accessibility: - The system aims to be user-friendly, providing a seamless experience for both healthcare professionals and patients. Accessibility through fingerprint recognition on compatible devices ensures ease of use.
6.Technological Integration:- Integration with current communication technologies allows for remote access to health records. This ensures that the system remains practical and aligns with contemporary healthcare practices.
7.Compliance with Privacy Regulations:- Ensuring compliance with privacy regulations is paramount. The Fingerprint-Based Medical System is designed to adhere to ethical and legal standards, safeguarding patient privacy in accordance with healthcare regulations. In summary, the problem at hand involves the inadequacies of current health record access methods and the pressing need for a secure, efficient, and user-friendly solution. The proposed Fingerprint-Based Medical System aims to address these challenges by leveraging advanced biometric technology to revolutionize the storage and retrieval of patient clinical records

VI. CONCLUSIONS

A fingerprint-based victim identification scheme during an emergency situation is proposed in this paper. The project is focusing on using the fingerprint in a protected form to provide both security and privacy. Whenever victim is meet with accident hospital authority can use fingerprint of victim to identify the medical information.

REFERENCES

1. S.H. Almotiri, M. A. Khan, and M. A. Alghamdi. Mobile health (m- health) system in the context of iot. In 2016 IEEE 4th International Conference on Future Internet of Things and Cloud Workshops (FiCloudW), pages 39–42, Aug 2016.
2. Gulraiz J. Joyia, Rao M. Liaqat, Aftab Farooq, and Saad Rehman, Internet of Medical Things (IOMT): Applications, Benefits and Future Challenges in Healthcare Domain, Journal of Communications Vol. 12, No. 4, April 2017.
3. Shubham Banka, Isha Madan and S.S. Saranya, Smart Healthcare Monitoring using IoT. International Journal of Applied Engineering Research ISSN 0973-4562 Volume 13, Number 15, pp. 11984-11989, 2018.
4. K. Perumal, M. Manohar, A Survey on Internet of Things: Case Studies, Applications, and Future Directions, In Internet of Things: Novel Advances and Envisioned Applications, Springer International Publishing, (2017) 281-297.
5. S.M. Riazulislam, Daehankwak, M.H.K.M.H., Kwak, K.S.: The Internet of Things for Health Care: A Comprehensive Survey. In: IEEE Access (2015).
6. P. Rizwan, K. Suresh. Design and development of low investment smart hospital using Internet of things through innovative approaches, Biomedical Research. 28(11) (2017).

7. K.R. Darshan and K.R. Anandakumar, "A comprehensive review on usage of internet of things (IoT) in healthcare system," in Proc. International Conference on Emerging Research in Electronics, Computer Science and Technology, 2015.
8. Internet of Things (IoT): Number of Connected Devices Worldwide From 2012 to 2020 (in billions).
9. Barber B. 1998, Patient data and security: an overview, International Journal of medical informatics, 49(1), pp. 19-30.
10. Changrui Xia, Arthur Yu, 2006, Medical smart card system for patient record management, Science new magazine.
11. Daesung,Moon,Yong Wha,Chung,Sung,Bum Pan , Jin Won Park, 2006, Integrating fingerprint verification into the smart card based health care information system, Computer Methods & programs in medicine, 81(1), pp.66-78.