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FINGERPRINT ACCESS CONTROL FORE-HEALTH RECORDSINHOSPITALS

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ABSTRACT

In most of the hospitals, patients medical records are maintained in traditional methods as large paper files and

documents. Technological advancements are evolving rapidly and improving the quality of life substantially. One of the advancements is Electronic Medical Records

[6].AnElectronic Health Record is the systematized collection of a

patientshealthinformationwhichiselectronicallystoredi nadigitalformat.E-HealthRecordscanimprove the kinship between the

patients and doctors. Identifying a personusing

thebiometriccharacteristicisanecessary method to security.Though increase the there aremanybiometricfeatures available for authentication, fingerprintisused because it is morepracticalone to capture. The use of biometrics for identification has a majo rroleinsustaining the privacy and security [8] of the

healthcaresystem.Efficiencyandsecuredaccessofthepat ients

healthrecordisrequiredtoprescribemedicine. Thepaper proposes to develop health a recordmanagementsystemwithfingerprintbiometricsa ndloginwithpasswordsforauthentication.Boththefront endand backend is done using MATLAB. ToconnectthedatabasewithMATLAB,PostgreSQLisus ed.Theproposedworkincludes retrieval of patient's data fromthehealth records of the hospital database when he fingerprint is matched and the creation of

aloginportal forauthentication.

Keywords: Fingerprintrecognition,electronichealthrecord,MATL AB

1. INTRODUCTION

On a daily basis, millions of patients visitdoctorsinhospitalsandotherhealthcareclinics [9]. Each of these visits increases the new medical record or modify theexisting record.Forstoringandretrievingof records, user authentication technology а isrequired.Patientsshouldhavethe assurance that the privacy of their recordswill be well kept safe. And for that purpose, the E-HealthRecord(EHR)managementsystemiscreated which is accessed with biometric stoprovide security for patients and healthcare professionals.

This system isproposedtoreducethelargepaperworkinhospitalsandtoad dressthedeficitofhealthcare staff. Both physicians and patientshave to trust and rely on the data which may be complete,accurate,and secure. The use of technology for enhancing

healthcareserviceshasreceivedsignificantoutcomes in recent years. Due to digitization of healthrecords, quality of patientcarewill increase along with large efficiency.Asmoreandmorehospitalsandhealthcare systems migrate to computerizedelectronichealthrecords,morehealthinformat

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ionexchangesarebuilttocoordinatecare across networks and with effective datamanagement to ensure it is kept free fromcorruption,modification,orunauthorizedaccess.

Biometricsplaysamajorroleinthissystemasitisthei dentificationofanindividualbasedonfeature they have.Biometricrecognition is necessary asidentityof an individual cannotbedistributedorlost and itcreate a really powerfultoolin identitymanagement. The issue of security is often a concernwhen it comes to the confidentiality of

medicalinformation.Herethefingerprintsofthepatientsareu sedtoprovideaccesstousetheirmedicalrecords.It

isapattern recognition system that recognizes a personby his or

herfingerprint.Passwordsandpinauthenticationareusedtose curethecomputersystemsfromunauthorizedaccesssinceinc ompleteormisunderstoodhealthcarerecordscanleadtowron gmedications and complexities.

2. LITERATUREREVIEW

Therearevariousmethodstoaccesselectronic health records in hospitals. Identificationcardsorsmartcardscanbegivenasproposedby Hinkamp[3], which stores the information regarding the patient. The information can be retrieved by a servernetworkanddisplayedonascreen. This method provide sagoodsolutionforreal-timeaccess to emergencies while the difficulty in using this approach is that the patient should always carry the identificationcard or smart card while vising the hospital. This makes the approach unfeasible for thehealthsystem.

Microsoft Health Vault and former GoogleHealth[2]providespacetostoremedicalinformation for any registereduser. Thesewebservicesareeffectiveinstoringinformation.Itdepe ndsonthepatientscredentials, such as username and password.But this approach will become unsuitable ifthepatientforgetssuchcredentialsorisunabletoprovidesuc hinformationinagivensituation.

Theotherapproaches requires martphones as described by Gardneretal. [4].

Thepatientwhoentersthehospitalcarriesthehealthrecordsin hissmartphone.Thepatientcan access the records by providing the rightcombinationofpasswordsor biometrics.Anothermethodisusingcontact-

lessfingerprintsensorsandfacerecognitionsystems[1]. This method uses a secure, touch-lessdata acquirement from the distancetoreducetheriskof impersonation or fraud. This method

alsoreducestheriskofuserscontracting infections. Butthereissignificant expense involved in the implementation of the sesensors.

3. PROPOSEDWORK

Thissectiondeals with the model of our system and th

eprocessofextractionandthinningoffingerprints. Theotherd etailsandarchitecture of the system will he explained in the subsequent sections. Our main objective is provide paperlessconsultationandcheckto upswithhighefficiency and privacy preserved access tothe medical health records of patients.Wematched the fingerprint in order to provide permission to retrieve the patient's records, which ensures no record mix up takes place.We aimed to provide a centralized databaseaccessthatcanbeusedbyanyhospitals, pharmacies, scanningcentersandtestlaboratories. The system design of EHRis intheFigure1.

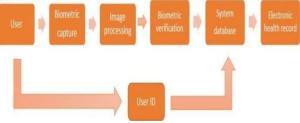


Fig1:System designof EHR

3.1 Userapproachingthesystem

The user is the patient who has come to visitthe hospital in order to treat the ailments ormay be for a normal check-up. He or Sheneed not bring any files or test reports ormedicalprescriptionsofthepreviousvisitsasalltheinforma tionrightfromthediagnosistotreatmenttomedicinesprescrib edwillbestoredintherecords.Thisprovidesthepatientsa hassle-freeenvironment.

3.2 Biometriccapture

Firstthebiometricsampleoftheindividualisloadedi nthedatabase.Whenthepatientwantstoaccessthehealthreco rd,thefingerprintisgivenasinputimage.Fingerprints are obtained by the replication of а fingertipepidermis, when a finger gets contact with the smooth surface. After this the unique features are extracted from then thebiometricsampletocreatetheusersbiometrictemplate [7].

3.3 Imageprocessing

The fingerprintimageof the individualisconverted into a template. The system rememberstheminutiaeinformationlike itslocation,direction, and users demographicdata as a

template in the enrollmentdatabase.

3.4 Biometricverification

The newly formed template is compared withthestored templateand matching is found based on themaximummatchofminutiapoints.Thebiometricverificat ionisdonebythematchingofminutiapointsextractedfromthe inputfingerprintwiththeminutiapointsofalreadystoredfing erprint.

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3.5 Storagedatabase

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The fingerprints are stored in a folder and itslocation is stored by a name in the database.InordertoaccesstheE-

HealthRecords, if the finger prints do not matchafter finger p

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3	2 Reena	Byham	Prictr of abd wall w foreign body w/o	rbyham1@java.com	Female	86(556)108-1168	20/05/68	39065 Randy Crossing	23/10/17	5bf6ca4afc13ae7a20000065	00000_01.bm
4	3 Magda	Randerso	Toxic effect of formaldehyde	mranderson2@trellian.com	Female	86(912)391-0168	10/8/1960	42774 Stang Lane	29/12/17	5bf6ca4afc13ae7a2000066	00000_02.bm
5	4 Nady	Vanin	Osteonecrosis in diseases classd elsi	v nvanin3@hubpages.com	Female	52(220)601-8843	4/2/196	79 Reindahl Circle	25/06/18	Sbf6ca4afc13ae7a2000067	00000_03.bm
5	5 Wynnie	Bilings	Puncture wound without foreign box	f wbillings4@economist.com	Female	62[527]319-3587	9/4/1973	38781 John Wall Cross	12/8/2017	5bf6ca4afc13ae7a2000068	00000_04.bm
2	6 Simone	Francescu	Disp fx of base of second MC bone. I	t sfrancescuzzi5@mapy.cz	Male	86(438)822-6053	31/01/59	399 Myrtle Plaza	18/09/17	5bf6ca4afc13ae7a20000069	00000_05.bm
8	7 Joseph	Kimpton	Texic effect of venom of other snake	, Rimpton5@springer.com	Male	237(885)176-649	1/2/1995	8650 Eggendart Alley	28/06/17	5b/6ca4afc13ae7a2000005a	00000_06.bm
9	8 Cybil	Josebury	Other secondary gout, right wrist	cjosebury7@addthis.com	Female	62(802)377-6723	3/12/1983	76 Surrey Parkway	9/9/2018	5bf6ca4afc13ae7a200006b	00000_07.bm
10	9 Chance	Lapsley	Inj extn musc/fasc/tend at forearm k	e clapsley&@wiley.com	Male	46(195)726-8785	24/06/82	22234 Glacier Hill Drive	14/12/17	5bf6ca4afc13ae7a200006c	00000_08.bm
1	10 Caz	Kehri	Dry eye syndrome	ckehr/5@ow.ly	Male	86(412)781-1891	26/02/58	27 Melvin Way	10/2/2013	5bf6ca4afc13ae7a200006d	00000_09.bm
12	11 Brita	Menzies	Lateral epicondylitis, right elbow	bmenziesa@liveinternet.ru	Female	7(795)536-7773	22/09/86	59478 Lotheville Pass	16/02/18	5bf6ca4afc13ae7a2000006e	00000_10.bm
13	12 Letty	Kiddle	Unspinj musc/fasc/tend at shidr/up	a Riddleb Øcbc.ca	Female	62(124)952-6304	2/3/195	229 Prairie Rose Cente	25-08-18	5bf6ca4afc13ae7a2000006f	00000 11.bm
4	13 Dennis	Kleinpelt	Displaced dome fx left talus, subs for	r dkleinpeltzc@cdc.gov	Male	63(636)636-1707	24/02/66	2398 Kim Alley	24-09-17	5b/6ca4afc13ae7a20000070	00000 12.bm
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7	16 Terrell		Person on outside of snowmobile in		Male	595(904)781-290	27/12/92	18034 Division Drive	11/9/2018	5bf6ca4afc13ae7a20000073	00000 15.bm
18	17 Sim		ABO incompatibility with hemolytic			85(311)459-6194	13/08/66	56 Mifflin Court	6/5/2017	5bf6ca4afc13ao7a20000074	00000_16.bm
19	18 Odette		Malignant neoplasm of tongue, unsp		Female			50772 Messerschmidt	23-10-18	5bf6ca4afc13ae7a20000075	00000 17.bm
10	19 Zce		Burns of 70-79% of body surface w 60		Female	55(773)996-2744				5bf6ca4afc13ae7a20000076	00000 18.bm
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23	22 Jemilyn	Slav	Avulsion of scalp, initial encounter					55 Bartelt Crossing		Sbf6ca4afc13ae7a20000079	00000 21.bm
34	23 Werdall		Other specified coagulation defects		Malo	380(277)931-982		456 Dunning Drive		5bf6ca4afc13ae7a200007a	00000 22.bm
15	24 Reilly		Driver of pk-up/van injured in clsn w		Male			78 Holmberg Road		1 5bf6ca4afc13ae7a200007b	00000 23.bmg

Fig2: Database inexcelformat

3.6 Electronichealthrecords (EHR)

The E-Health Records are the digital records of the clinical data up to date of the patientalong with the medical history. It containsName,Diagnoses,E-Mail,Gender,Phonenumber, Date of Birth, Address, Date joinedand Password. Every time the patient visits the hospital, the entire information will beupdated. This makes the work of the patientas functioning of hospitals easy.

4. IMPLEMENTATION

Asstatedinsection3.2ourtechniqueinvolvesfinger printextraction, fingerprintmatching and data retrieval which has been implemented using Matlab[5]and PostgreSQL.Fingerprints are peculiar patterns made ofridgesandfurrows, which can be seen on all fingers. All people have unique fingerprint and they cannot be same even for identical twins. The fingerprints identificationis used in almost all areaslike background checking, security access, during disaster determination, and criminal offenses. The two important featuresoffingerprint are its uniqueness and existence. In person's addition. each fingerprints remainunchangedintheir entire lifespan. The new skin cells formed gets blendedwith the existingfurrow pattern and friction ridge.

4.1 Ridgepatterns

Friction ridges are classified into three types as

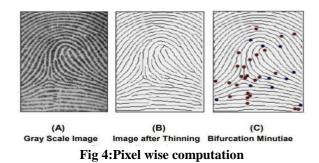
shown in figure 3. Loops, whorls, and arches are with incomparable variations, depending on the shape and relationship of the ridges.



Fig 3: Loop, Whorl & Arch of afingerprint

4.2 Thinningoftheimage

During thinning process, width of the ridges are reduced to one pixel which helps in extracting minutiaepointsfrombinaryimages. The pixelwise computati onoffinger printimage is shown in figure 4.



Fingerprintthinningisthetechniqueofreducingthet hicknessofeveryridgepatterntoasinglepixelwidth.Afterextr actingtheminutiaefromtheimproved,binarizedandthinnedi magepost processing is carried out on this image to remove

falseminutiae. The input finger printimage and thinned finger print images we obtained are shown infigures 5 and 6 respectively.



Fig5: InputFingerprint Image

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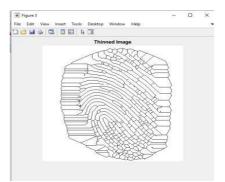


Fig6:Outputimageafter Thinning

4.3 Minutiaeextraction

This is the most popular and widely usedtechnique, being the basis of the fingerprintcomparison. Minutiae are extracted from both fingers and are stored as sets of pointsinthe2Dplane.Then matchingis done among the templateandinputminutiaeto identify maximum quantity of minutiae pairings. TheMinutiaecomparisonisbased onloop, whorl or arch forinitial comparisons and further analysis.

An

investigatorofacrimescenefirstgatherfingerprints from the crime sceneand compare the printsside byside with the known fingerprint databaseto identify a match.Generally,fingerprintof good quality willcontain40–100 minutiae points. The figure 7 showsthefingerprintimageafterminutiaeextraction.



Fig 7: Output image after MinutiaeExtraction

4.4 Ridge end finding & bifurcation

In poor qualityfingerprintimages it is very difficult the minutiae to extract points.However,localorientation, frequency,ridgeshape, andtextureinformation of each fingerprint areextracted which may not show high distinctiveness. The approaches belonging to this family com parefingerprintsintermoffeaturesextractedfromtheridgepa ttern.Minutiae,fromasimpleperspective,indicatewhereasig nificantchangeinthefingerprintoccurs. These changes aresh owninFigure8.The dark lines in the imagerepresentridgesandlightlinesrepresentvalleys, Arrow Α shows region where а oneridgesplitsintotworidgescalledaBifurcationandArrow BshowswhereaRidgeends.

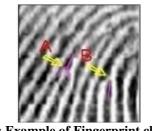


Fig 8: Example of Fingerprint changes

The two most prominent localridgecharacteristicsareRidgeEndingandRidgeBifurca tion.Atridgeendinga ridgeendssuddenly andridgebifurcationmeansthepointwherearidgedivergeint obranchridges.Collectively,thesefeaturesarecalledminutia e.Afterlocatingthesefeaturesinthefingerprint,theminutiaex tractionsoftwaredeterminesasignificantdirectionofthechan geusingArrowBasanexample,thesignificantdirectionstarts attheendoftheridgeandmovesdownward.Thesetofminutiae areshown figure9.



Fig9:Extracted minutiae&axes

The resultant minutae, in their simplest form are the collection of all reasonable bifurcations and ridge endings, their location and their significant direction. Figure 10 shows the ridge end findings in fingerprint image.

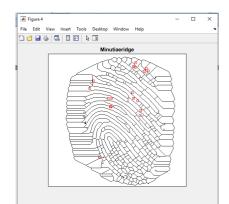


Fig 10:Output image after finding ridgeend

4.5 Dataretrieval

Data retrieval is the process of identifying and extracting the required information from the hospital database system. Postgre SQL native interface database connection is used to import product data from a database table into MATLAB using a Postgre SQL database. Then, a

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simple dataanalysis is performed.Thenextstepafterfingerprintmatchingistheretri evalof therecords.

Firstly, database is created а in PostgreSQLusing queries where the dataset is linked tothe database created in order to display thehealth record of a person once fingerprint ismatched. The dataset includes the patient'sname, Diagnoses, E-Mail, Address othercommoninformation. and SincefingerprintmatchingisdoneinMATLABthedatabasec reated is connected with the MATLAB. The figure 11 shows theglimpseofdatabaseconnectedusingPostgreSQL.

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Fig 11: Database in PostgreSQl

The hospitals maintain the health record of the patient confidentially, so we downloaded a dataset consisting of patient's health record from Kaggle. This dataset is connected with the created database. The fingerprints of the patients are also linked to the database. When the input finger printismatched with the finger print of patient present in the database then the health records associated with the patients are retrieved from the database and are displayed in the command window of MATLAB. If the input finger print present in the database then apop-

upwindowappearsaskingforuserIDandpassword.EmaiIID ofeverypatientisconsideredastheuserIDanda unique password is given to every patient.Thegivendetailsshouldmatchwiththedetailsintheda tabase.Thenthepatients'datacanbeviewed.

5. RESULTS

5.1 Fingerprint Matches

The output obtained when input fingerprintimage matches with the fingerprint image inthe database is shown in figure 5.1.

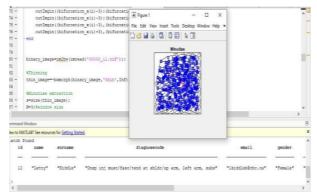


Fig 5.1 Patient's Data Obtained whenFingerprintMatches

5.2 Fingerprint Mismatch

The output image of the login portal whenthe input fingerprint image does not matchwiththefingerprintimageinthedatabaseisshownin figure 5.2.

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Figure 5.2 Input Finger print does not Matchwith Finger print Image in Database

5.3 Successful Login

TheoutputobtainedwhenthegivenUserIDandpass wordmatchwiththeUserIDandpasswordindatabasealongw iththepatient's data in the command window isshownin figure 5.3.

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Figure 5.3 Patient's Data Obtained whenLoginis Successful

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5.4 Unsuccessful Login

The outputobtained when givenUserIDandpassworddoesnotmatchwiththeUserID and password in database is showninfigure5.4.

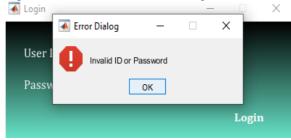


Figure 5.4 Error Dialogue Box OpenedwhenUserIDorPasswordisincorrect

6. CONCLUSION AND FUTUREWORK

Fingerprint matching plays a major part inachieving result this paper. the of For that, firstlyMATLAB2021 aapplication is installed. Eitherth efingerprintcapture from the scanner or the readily availablefingerprintimagesofthepatientsarestoredin а folder. Health records of the patientsthat consist of name, ID, address, diagnosecode, birth date, email ID, phone numberand password in excel format is connected to the MATLAB2021 ausing PostgreSQL.

Whenaninputfingerprintisgiventheminutiaepoint sinthefingerprintareextracted and are compared with the otherfingerprints stored. This can be done byminutiae thinning extraction and algorithminMATLAB2021a.Oncomparisontheresult is obtained, whether it is matched ornot.Oncematchedthedetailsoftheparticularpatientisdispl ayed. Health details can also be fetched using user ID and passwordincaseofunavailabilityoffingerprintsoranydiscrepancie swhilematchingthefingerprints.

Theprocesscanbeextendedtoacentralizedloginap proach.Inthisapproachthehealthrecordsofany personcanbeaccessedinanyhospitalalloverthestateorcity with his her fingerprint or or login ID. The database can be linked to the scancenters, x-ray centers and pharmacies. Thescan images and prescriptions also can beuploadedalongwiththeirotherrecords. This enables that th epatientsneednotcarrythepaperreportseverywhere.

Authentication is a second step verification process that is used for security process. Itis also compatible with most of the fields.In arts, archaeology and anthropology, the common problem is to that ensure а givenartifactwasproducedbysomeoneorsomewhereorahist oricalperiod.Incomputerscience, verification of user identity often required to allow is access toprivate information or applications. The ways in which a person can be verified fallintothreecategories, basedon what are known as authenticity factors: somethingthe user knows and something the user has.Eachauthenticity

itemincludesalistofitems used to verify or verify a person'sidentity prior to granting access, approvingatransactionrequest, signingadocumentorotherpr oduct, authorizing others, and establishing a series of authority. This can be done in future in order to avoid someotherperson to loginillegally.

7. **REFERENCES**

[1] Biometrics, http://www.biometricupdate.com/

[2] Microsoft Health Vaulthttp://www.healthvault.com/Personal/index.html

[3] Hinkamp T. System providing medical personnel with immediate critical dataforemergencytreatments.PatentApplicationPublicatio n11/510,317,2007.

[4] Akinyele,J.,PaganoM.,Green,M.,Lehmann,C.,Peters on,Z.,andRubin,A.2009."Securingelectronicmedicalrecor ds on smart phone". SPIMACS '09Proceedings of the 1st ACM workshopon Security and privacy in medical andhome-caresystems, November 9- 13, 2009.

[5] A.P.Sricastava,ShashankAwasthi,AwanishKumarK aushik,ShubhamShukla,"Fingerprintrecognitionsystemus ingMATLAB",InternationalConferenceonAutomation,C omputationalandTechnologyManagement,AmityUniversi ty,2019.

[6] AmbroseA.Azeta,Da-

OmieteA.Iboroma,VictorI.Azeta,Emmanuel.O. Igbekele , Deborah O. Fatinikun ,EbukaEkpunobi,"ImplementingaMedicalRecordSystem withBiometricsAuthenticationinE-

Health", inIEEEA fricon2017Proceedings.

[7] B. Nivedetha, Ila. Vennila, "FFBKS: Fuzzy Fingerprint Biometric Key Based Security Schema for Wireless Sensor Networks", Computer Communications, Volume 150, Pages 94-102, 2020.

[8] DarrellShawl,"Biometrics-

ImplementingintotheHealthcareIndustryIncreasestheSecu rityfortheDoctors,NursesandPatients",DavenportUniversi ty,November10,2013.

[9] José R. Díaz-Palacios, Víctor J. Romo-Aledo, AmirH. Chinaei, "Biometric Access Control for e-Health Records in Prehospital Care", University of Puerto Ricoat Mayagüez.

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