HOSPITAL BIOMETRIC FACE RECOGNITION ATTENDANCE SYSTEM

Mukiibi Zakaria[1], Akol Tom[1]

1-St Lawrence University, Email: *mukiizex@gmail.com, akoltom72@gmail.com

ABSTRACT

Hospital biometric face recognition attendance system is a system that is designed to operate in the medical health facilities. It is a system which monitors the attendance of the health workers specifically in public health facilities. Basing on the study held in some specific health facilities in Uganda, Kampala. It was realized that many health facilities face the problem of the health workers absenting themselves from duty leaving patients who need to be attended in urgency battle for their lives. It was also realized that though there are health workers who attend, they report at their own time not at the time they are supposed to report on duty. This still gives a big gap in the services they are supposed to deliver. Furthermore, the health workers are found of leaving duty (absconding) yet they are supposed to be on duty within the hours of work. That has caused a high death rate in the country since some patients need urgent and monitored medical attention which is not there because the medical workers who are supposed to attend are not present on duty

Keywords: Bio-metric, Face Recognition, Hackers, Fraud, Database.

INTRODUCTION

In today's networked world, the need to maintain the security of information or physical property is becoming both increasingly important and increasingly difficult. From time to time we hear about the crimes of credit card fraud, computer break-in by hackers, or security breaches in a company or government building. In most of these crimes, the criminals were taking advantage of a fundamental flaw in the conventional access control systems: the systems do not grant access by "who we are", but

by "what we have", such as ID cards, keys, passwords, PIN numbers, or mother's maiden name. None of these means really define us. Recently, technology became available to allow verification of "true" individual identity. This technology is based in a field called "biometrics". Biometric access control are automated methods of verifying or recognizing the identity of a living person on the basis of some physiological characteristics, such as fingerprints or facial features, or some aspects of the person's behavior, like his/her handwriting style or keystroke patterns. Since biometric systems identify a person by biological characteristics, they are difficult to forge. Face recognition is one of the few biometric methods that possess the merits of both high accuracy and low intrusiveness. It has the accuracy of a physiological approach without being intrusive. For this reason, since the early 70's (Kelly, 1970), face recognition has drawn the attention of researchers in fields from security, psychology, and image processing, to computer vision.

Biometrics technologies are used to identify, verify, or confirm a person's identity based on their physiological (external appearance) or behavioral (how they act) characteristics. The Physiological characteristics are assessed through morphological identifiers (mainly consisting of fingerprints, the hand's shape, the finger, vein pattern, the eye (iris and retina), and the face's shape) and biological analyses (DNA, blood, saliva, or urine). Behavioral characteristics are commonly assessed using voice recognition, signature dynamics (speed of movement of pen, accelerations, pressure exerted, inclination), gait (i.e. individual walking style) or gestures. Biometrics allow a person to be identified and authenticated based on verifiable unique and specific data. Biometric identification consists of determining the identity of a person by capturing an item of their biometric data (e.g. a photograph) and comparing it to the biometric data of several other persons kept in a database, providing an answer to the question 'Who are you?'. Biometric authentication compares data on a person's characteristics to their biometric data to determine resemblance and provides an answer to the question 'Are you Mrs. or Mr. X?'.

Facial recognition (or face) recognition technologies (or FRTs) are a specific type of biometric technologies that refer to a multitude of technologies used for different purposes, ranging from the simple detection of the presence of a face in an image, to more complex verification, identification,

and categorization or classification of individuals. Verification (one-to-one comparison) enables the comparison of two biometric templates, usually assumed to belong to the same individual. Identification (one-to-many comparison) means that the template of a person's facial image is compared to other templates stored in a database to discover if their image is stored there. Face Recognition Technologies are also used to perform a categorization (or classification) of individuals, based on their personal characteristics. In this respect, a wide range of software has been developed to assess the attributes of a person from their face, for the purpose of 'face attribute classification' (e.g., gender, race, or ethnicity), or for 'face attribute estimation' (e.g., age). Furthermore, Face Recognition Technologies can be used to classify facial expressions (such as a smile), or the emotional state of a person (such as 'happy', 'sad' or 'angry'). Face recognition technologies are widely applied In European countries like USA, Germany, and United Kingdom among others. This technology is deployed in many departments, or institutions of those European countries and it is playing a big role in such institutions. In Hungary, 35 000 CCTV cameras now operate as part of a single centralized searchable system, and its biometric databases have been connected, allowing police to identify any citizen from their face. The Hungarian Secret Services and police have already made use of the system, resulting in 6000 matches, 250 stop-and-searches and 4 arrests. In china, the technology is applied in schools so as to monitor the security of the schools, it also monitors the attendance of the students and finds out those who miss classes.

LITERATURE REVIEW

A biometric is a device that captures a person's attendance information through either fingerprints, face recognition, eye recognition or any other required part of the body. Biometric systems are deployed in work places, schools, churches or any other sensitive institution. Face recognition technology is just a component from the entire biometric recognition technologies. It is a way of identifying or confirming an individual's identity using their face. Facial recognition systems can be used to identify people in photos, videos, or in real-time. Facial recognition is a category of biometric security.

Many people are familiar with face recognition technology through the Face ID used to unlock phones (however, this is only one application of face recognition). Typically, facial recognition does not rely on a massive database of photos to determine an individual's identity — it simply identifies and recognizes one person as the sole owner of the device, while limiting access to others. Beyond unlocking phones, facial recognition works by matching the faces of people walking past special cameras, to images of people on a watch list.

Apart from monitoring the attendance, Some Hospitals use facial recognition to help with patient care specifically in European countries like China. Healthcare providers are testing the use of facial recognition to access patient records, streamline patient registration, detect emotion and pain in patients, and even help to identify specific genetic diseases. AiCure has developed an app that uses facial recognition to ensure that people take their medication as prescribed. As biometric technology becomes less expensive, adoption within the healthcare sector is expected to increase. Jeromy et al [11]. report that all public health care institutions need the technology that monitors the attendance and the performance of the health workers in order to have patients attended. This therefore gives an implication that the technology is much more used in various institutions and for various performances so far mainly in developed countries.

However, according to various arguments, some sources of the information do not support the use of the technology while others do support. Critics of the technology Negate that the London Borough of Newham scheme has, as of 2012, never recognized a single criminal, despite several criminals in the system's database living in the Borough and the system has been running for several years. "Not once, as far as the police know, has Newham's automatic face recognition system spotted a live target. This information seems to conflict with claims that the system was credited with a 34% reduction in crime (hence why it was rolled out to Birmingham also). Advocates note that as per security, the criminal acts in china have reduced by 16%, due to the deployment of the systems that monitor the movement of people in the streets and many criminals who have in criminal acts have been apprehended to the hands of the laws . Badgerleey et al report that face recognition systems deployed

in different streets across the world have lifted up the world security in respective countries. It is important to note that the deployment of cameras in Uganda has sharply reduced the criminal acts in the country unlike where there were death all over the country and yet no criminals could be apprehended

RESEARCH METHODOLOGY.

RESEARCH DESIGN.

The research designed questionnaires and used interview techniques to investigate the need to have hospital biometric face recognition attendance system. The research used qualitative and quantitative data analysis to come up with solution of the type of the system requires in health facilities. The choice to this research design was due to the following:
Quantitative data analysis covers a large amount of data gathered and then analyzed statistically. This almost erases bias, and if more researchers ran the analysis on the data, they would always end up with the same numbers at the end of it. It gives the researcher more control over how the data is gathered and is more distant from the experiment. An outside perspective is gained using this method. It is also focused.

TARGET POPULATION.

The target population will be heterogeneous due to the nature of the hospitals within Kampala. The target population is mainly the patients and the health workers of the public health facilities and also private health facilities but for this research, that will concentrate on the patients and the health workers of Mengo hospital, Mulago hospital and Nsambya hospital. That brought up the

SAMPLE SIZE.

The main target population is health workers and patients. Health workers are sampled irrespective of their departments and the same applies to patients as they are sampled irrespective of their sicknesses to randomly give their view on the subject matter. Three hospitals are sampled for the research study and they include Mengo hospital, Nsambya hospital and Mulago Hospital. All these hospitals are public hospitals located in Kampala Uganda, but the main hospital where the study is emphasized

is Mengo hospital located in Kampala Uganda. A total number of 20 medical staff, 25 medical staff and 19 medical are sampled in Mengo hospital, Nsambya hospital and Mulago Hospital respectively. Also 100 patients, 33 patients and 56 patients are sampled in Mengo hospital, Nsambya hospital and Mulago Hospital respectively. This brought up all the total of 64 medical staff and a total of 189 patients who rare sampled during the research.

SAMPLING TECHNIQUE.

Stratified random sampling will be used so that it allows choice of few hospitals to represent the hospitals in Uganda. The same applies to choice of the heath workers to allow participation of Health workers randomly and in a distributive form from all departments. With this technique individual is chosen entirely by chance and each member of the population has an equal chance, or probability, of being selected. To enable the application of the technique to obtain a random sample, I will give each individual in a population a number, and then use a table of random numbers to decide which individuals to include.

DATA COLLECTION TECHNIQUES.

. The data collection techniques that will be used in all the research centers that is to say Mengo Hospital, Mulago Hospital and Nsambya Hospital are all the same. There are three data collection techniques used that is; Questionnaires, interview technique and observation technique.

Questionnaires. Questionnaires is a research document that consists of a series of a series of questions purposed for gathering the information from the respondents. These questionnaires composed of both closed ended questions and open ended questions..

Interview .interview technique is generally a qualitative research technique which involves asking open ended questions to converse with respondents in order to collect elicit data about research. Interviews are conducted with a sample from the population in the key characteristic exhibited is the conversational tone.

Observation. This is a qualitative research technique where the researcher

observes the participant's ongoing behavior in a natural situation. In other words the researcher has to capture data on what participants do concerning what they are supposed to do and in relation to what they say they do.

DATA ANALYSIS.

This is the process of bringing order and meaning to the information gathered (Mugenda 2003). It includes sorting data, editing and processing. The data was analyzed by use of both qualitative and quantitative methods. SPSS was used in analysis. Then tables and graphs were drawn to represent the information.

DATA COLLECTION, PRESENTATION, DATA ANALYSIS, INTERPRETATION, FINDINGS AND CONCLUSSION

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DATA COLLECTION

Data collection is through three approaches which include Interview method, questionnaire method and observation method. This data collection methods helped to come up with thee required information from the research study. Questionnaires are generated which included open ended questions and closed ended questions.

RESPONSE RATE

120 questionnaires were filled out of 160 questionnaires that were meant for the patients of Mengo Hospital. 67 were filled for the questionnaires that were meant for the health workers of the same hospital out of the 90 questionnaires that were expected for the health workers. 35 and 27 questionnaires were filled for the hospitals Mulago and Nsambya respectively which were meant for patients feed-back.

DEMOGRAPHIC INFORMATION OF RESPONDENTS

Table 1.0 showing the response rate at Mengo Hospital

Category of respondents	Targeted no	No of respondents	No of those who did not respond	Method of information gathering
Patients	73	53	20	Questionnaire
	200	167	33	interview
Health workers	90	67	23	Questionnaire
	89	37	52	interview

The table above summarizes the response rate of Mengo hospital patients and health workers. it shows that the targeted number of patients for questionnaire method of getting the information was 160 and the number of those who responded is 120, while those who did not respond is 40.

Table 1.1: showing the response rate at Mulago Hospital

Category	No of respondents	Method of information gathering
Patients	35	Questionnaire
	73	Interview
Health workers	67	Questionnaire
	36	Interview

From the table above , we see that 35 patients from Mulago Hospital responded through questionnaires and 73 responded through interview method. We also see that 67 health workers responded through questionnaires and 36 through interviews from the same hospital

Table 1.2: showing the response rate at Nsambya Hospital

Category	Targeted no	No of respondents	No of those who did not respond	Method of information gathering
Patients	53	27	20	Questionnaire
	47	42	05	Interview
Health workers	67	45	22	Questionnaire
	57	32	25	Interview

From the table above, we observe that the total number of patients given the questionnaires is 53 and only 27 were able to respond while 20 were not able to respond. For the interview method, 47 patients are interviewed while 42 are able to respond and 5 are not able to respond. Looking at the health workers of that health facility, 67 health workers are given questionnaires but 45 are able to answer while 22 are not able to respond. For the interview method, 57 health workers are interviewed and 32 are able to respond while 25 are not able to respond

PART B: THE NEED FOR HOSPITAL BIOMETRIC FACE RECOGNITION ATTENDANCE SYSTEM

Basing on the research conducted In the above health institutions, there is much information that attributed to the coming up of the need for hospital biometric face recognition attendance system. All that information is obtained from both the health workers and the patients around those specific hospitals.

Absenteeism rate of the health workers

From all the health institutions that is to say Mengo Hospital, Mulago Hospital and Nsambya hospital, it is observed that the rate at which the health workers miss to come for work is high leaving a big gap unfilled where by the impact is felt by the patients who need to be attended by the health workers and others end up losing their lives.

Table 1.3 showing the approximated absenteeism rate of health workers In Mengo Hospital, Mulago Hospital and Nsambya Hospital

Name of Hospital	Total No of health workers	Approximated No of attendants per day	Approximate absenteeisms per day	Attendance percentage	Absenteeism percentage
Mengo Hospital	167	100	67	59.88%	40.12%
Mulago Hospital	245	152	93	62.04%	37.98%
Nsambya hospital	146	87	59	59.58%	40.42%

From the table, we see that the approximated rate of absenteeism is high and the effect can already be imagined. We see that the approximate number of health workers in Mengo hospitals who attend duty per day is 100 out of the 167 total number of the health workers who are employed in the health facility. This amounts to a percentage of 59.88% for those who are approximated to be attending per day and 40.12 for those who miss to come each day.

Challenges faced by the patients in public hospitals

The respondents in the category of patients were asked to come up with the challenges they face in respective hospitals and the following is the response given by given individuals in respective hospitals and they gave out the response for what problems they face as patients. Here is a table showing the responses they gave in respective hospitals through questionnaires with closed ended questions.

Table 1.4 showing the problems patients in Mengo hospital go through

Problem	Frequency	Percentage
Luck of medicine	12	16.4%
Harshness of the medical workers	10	13.7%
Un attended for treatment	38	52.0%
High costs of treatment	03	4.1%
Poor services	7	9.6%
All services are perfect	3	4.2
Total	73	100%

The table above represents the way the patients answered the questions given to them. The frequency shows the number of patients who gave a given answer and in the right is the percentage of the students who gave that specific answer.

Table 1.5 showing the problems patients in Nsambya hospital go through

Problem	Frequency	Percentage
Luck of medicine	15	28.9%
Harshness of the medical workers	2	3.9%
Un attended for treatment	17	32.8%
High costs of treatment	14	26.5%
Poor services	1	1.9%
All services are perfect	3	5.8%
Total	52	100%

The table above for Nsambya Hospital. The frequency shows the number of the students who gave the specific answer and the percentage calculated in the right. It should be noted that more patients gave a response of patients being unattended in the health facilities and the other problem which is high in their health facility is the high costs of medical services.

Table 1.6 showing the problems patients in Mulago hospital go through

Problem	Frequency	Percentage
Luck of medicine	3	8.6%
Harshness of the medical workers	5	14.3%
Un attended for treatment	14	40.0%
High costs of treatment	5	14.3%
Poor services	1	2.8%
All services are perfect	7	20%
Total	35	100%

Causes of increased death rates in Hospitals

During the study, the medical workers were directed the question of what causes increased death rates in public hospitals in comparison to private hospitals.

Table 1.7 showing the causes of high death rates in public hospitals than private hospitals responded by the health workers of Mengo Hospital

Reason	Frequency	percentage
Incompetence	0	0%
Shortage of medicine supply	25	34.2%
Un attended patients	48	65.8%
Total	73	100

From the table above, we observe that no health worker believed and responded that the incompetence of their workers leads to high death rates in comparison to other private hospitals. 25 medical workers responded that it is caused by shortage of medicine supply and 48 responded that is because of patients being un attended.

Table 1.8 showing the causes of high death rates in public hospitals than private hospitals responded by the health workers of Mulago Hospital

Reason	Frequency	Percentage
Incompetence	1	2.9%
Shortage of medicine supply	14	40%
Un attended patients	20	57.1%
Total	35	100

The table above is for Mulago hospital, where by I health worker responded that incompetence causes high death rates, 14 said that it is shortage of medicine, and 20 said that it is due to patients being un attended. Percentages are corresponding in the right

Table 1.9 showing the causes of high death rates in public hospitals than private hospitals responded by the health workers of Nsambya Hospital

Reason	Frequency	Percentage
Incompetence	0	0%
Shortage of medicine supply	17	32.7%
Un attended patients	33	67.3%
Total	52	100

The table above is for Nsambya Hospital where patients responded that high death rates is high in public hospitals is high due reasons the following respective number f people gave.

The attendance system currently used

When researched about which system used by the health institutions, it was noticed both Mengo hospital, Mulago hospital and Nsambya hospital use manual attendance system where by each health worker has to register by them-selves in the book manually

FINDINGS

These are principal outcomes of the research project; what the research project revealed. This usually refers to the totality of outcomes.

Findings from Mengo hospital

It is found that Mengo hospital employs a total of about 200 health workers and has about 300 to 700 patients admitted every day. That gives a ratio range of 2:3 to 2:7, which is able to manage in terms of attending patients. Unfortunately, it is approximated that 120 health workers report each day which then gives un favorable ratio in terms of attending to the patients. The study also confirms that of those who attend for work, about 70% are able to arrive on time while the rest come late. Further-more, about 90% of those who attend each day work till the time required, while 10% abscond for their personal duties.

Findings from Mulago hospital.

Though the study was partially conducted in Mulago Hospital, the research shows that the hospital employs about 278 medical workers. It is also found out that the hospital has about 700 to 1000 patients admitted to the hospital every day. This leaves the ratio of the available health workers to that of the patients in the range of 1:2.5 to 1:3.6, meaning that one health worker would at a single day attend about 3 patients to 4 patients. Basing on the attendance statistics, it is estimated that about 200 health workers do turn up every single day, leaving the ratio at a range of 2:7 to 2:10, meaning that one health worker is to handle about 4 to 5 patients which is so hectic more over when some other patients are in need special attention.

Findings from Nsambya hospital.

The study is also partially conducted in this health institution. The health institution employs about 127 health workers. The hospital also has about 300 to 500 patients admitted every day. That gives a ratio range of about 1:2.4 to 1: 3.9. This gives an implication that each medical worker is to attend about 3 to 4 health workers. Of the total number of the health workers employed, about 120 health workers are believed to be reporting for duty every single day while the rest do not. Patients were given questionnaires about what problems they commonly face and 32.8% of the respondents responded that the main problem among the problem in the questionnaire is patients being un attended.

SYTEMS ANALYSIS AND DESIGN

Current system used.

Basing on the research conducted, it is observed that both Mengo hospital, Mulago hospital and Nsambya hospital which are the places where the research study was conducted are all using paperwork system for taking up the attendance of the health workers. The system gives liberty to the health worker to write his/her names on arrival, record the arrival time and the date. On departure, the health workers a gain record their personal information including the departure time in the books to show that some-one has left work at the required time. However, the system has limitations which cannot support effective tracking of the attendance of the health workers for example the records taken can easily be lost due to bad weather like rain and other things. Also it is not reliable since the attendants (users of the system) can fodge the arrival and departure since freedom is given to the users to enter their information. Also the system cannot be trusted because any user of the system can take the attendance for even friends who have not come for duty. Therefore the system is found wonting and required an improvement since the workers of the health facilities who use the system take the advantage of the weakness of the system to breach the work ethics.

Designed system to solve the problem.

The system designed to solve the problem is a hospital biometric face recognition system. The system is automated and does not require the more operation of an individual to take the attendance when reporting

to the health facility. The system has to main users, that is the admin and the health worker (user). The admin first registers the health worker to the system before the system starts taking his/her attendance. While registering, the system takes 300 images and stores those images. The system is then trained so that those images are converted in to binary codes which can easily be interpreted by the system.

5.2: DESIGN

This deals with decomposition of the system in to component pieces to make it easy to study how well those components can interact with each other to accomplish their purpose. System design is all about re-assembling the component pieces back in to a complete and an improved system. This involves adding and changing pieces relative to the original system

5.2.1: USE CASE DIAGRAM

This represents the dynamic behavior of the system. It enculpstates the system's functionality by incorporating Use Cases, Actors, and their Relationships. It models the tasks, services and functions required by the system

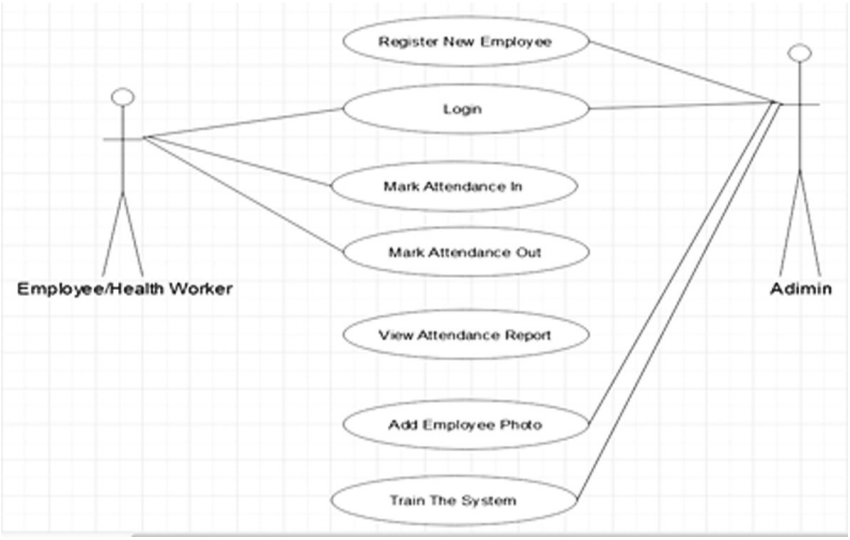


Figure 1: showing the use case diagram for Hospital biometric face recognition system

From the above Use Case diagram, the admin performs roles like logging in as admin, registering new employee, adding the employee photo and train the system so that the system will be able to interpret the photos of the employee in binary code and viewing the attendance report of the employees.

The Employee/Health worker is able to perform roles like logging in, marking the attendance in, Marking the attendance out, View the personal attendance report.

5.2.2: Class diagrams

This is the main building block in object oriented modeling. This diagram is represented by boxes that are partitioned in to three. The top partition contains the class name, the middle partition contains contains the class attribute and finally the lower one contains the method.

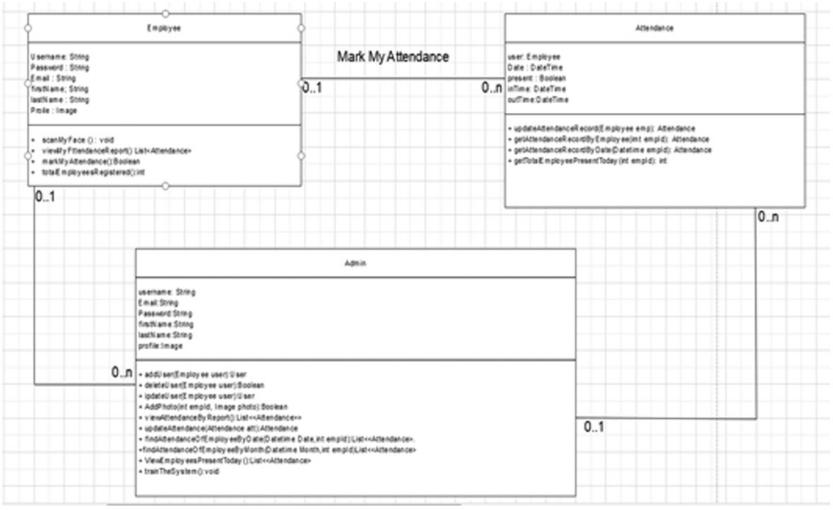


Figure 2: showing the class diagram for Hospital biometric face recognition system

Activity Diagram

Activity diagram is basically a flaw chart that shows the activities performed by the system. It describes the dynamic aspect of the system. According to this specific system, activity diagram is broken down in to

three for example. Admin activity diagram, Employee activity diagram and finally Attendance tracking activity diagram

Admin Activity diagram

This activity diagram shows the flaw of the activities performed by the administrator of the system.

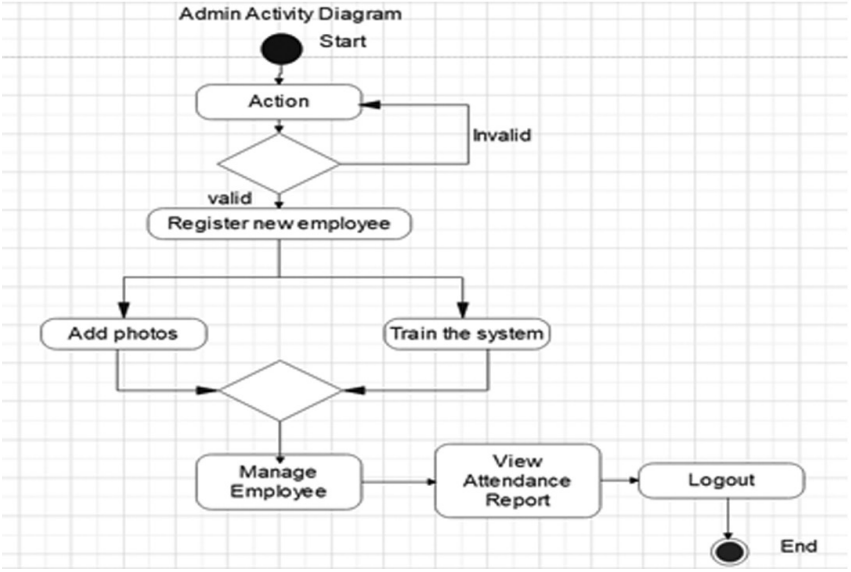


Figure 3: showing the Admin activity diagram for Hospital biometric face recognition system

This diagram shows the flaws between the activities of the system and these activities in the admin activity diagram include: registering new employee, adding new employee photos, training the system, managing the attendance, viewing the attendance then finally logging out

Employee Activity diagram

This activity diagram shows the flaw of the activities performed by the employee in the system.

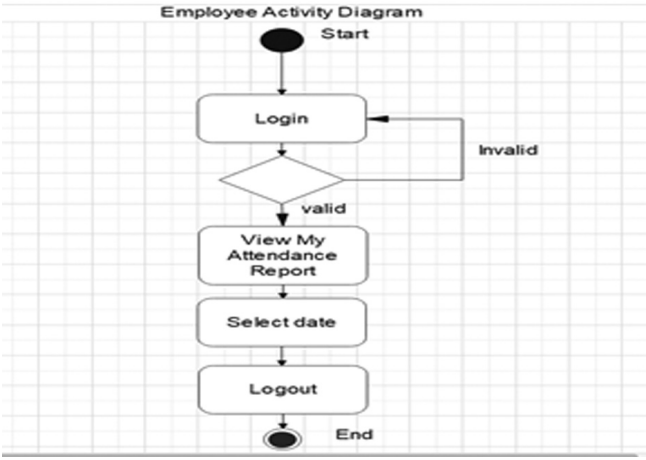


Figure 4: showing the Employee Activity diagram for Hospital biometric face recognition system

The activities in the employee activity diagram include logging in, viewing my attendance(personal attendance), selecting date and finally logging out

Attendance tracking activity diagram.

This activity diagram shows the flaw of the activities performed while tracking the attendance of the employees in the system

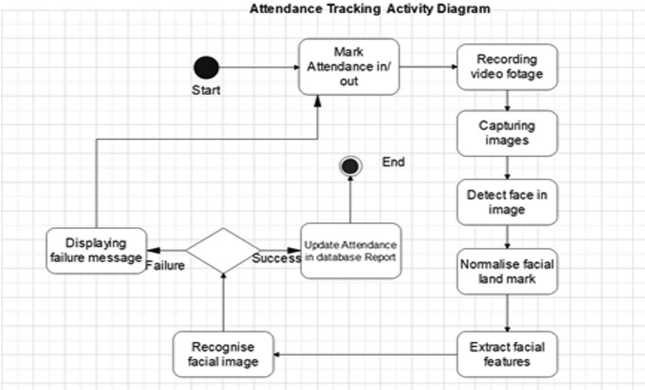


Figure 5: showing the use case diagram for Hospital biometric face recognition system

Package Diagram

This is a structural diagram which shows the organization and arrangement of various model elements In the form of packages.

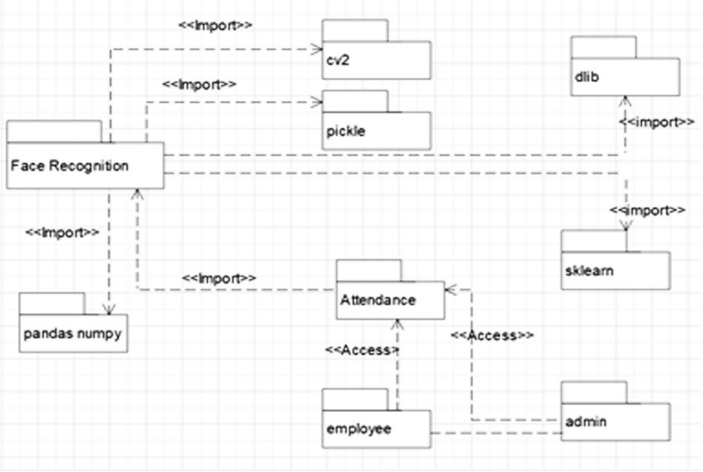


Figure 6: showing UML package diagram for Hospital biometric face recognition system

Deployment diagram

This diagram shows the execution architecture of the system including nodes like hardware or software execution environment and the middleware connecting them. It is typically used to visualize the physical hardware and software.

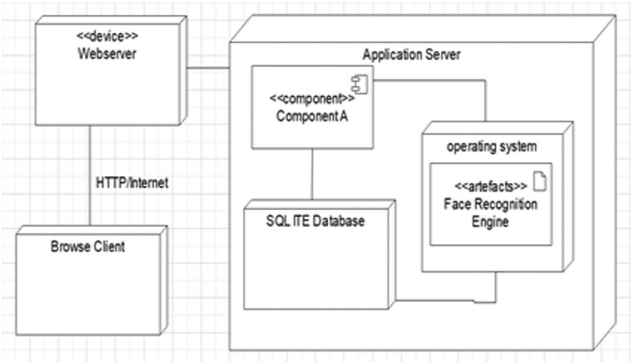
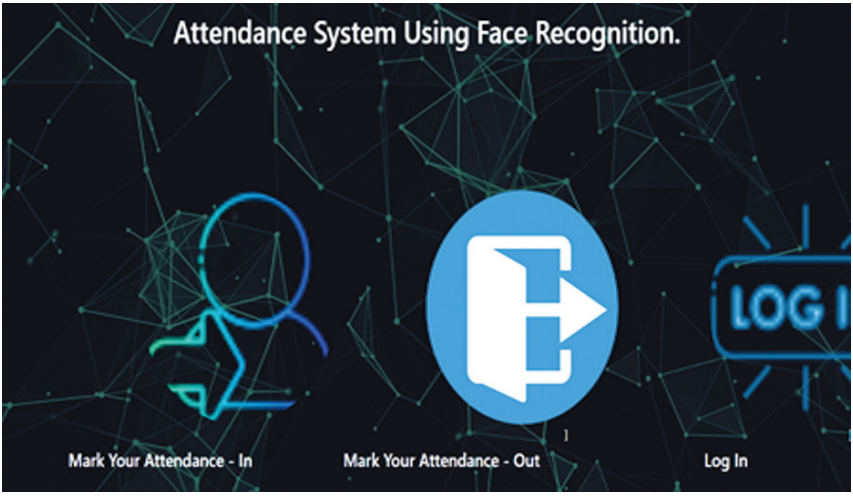


Figure 7: showing UML deployment diagram for Hospital biometric face recognition system

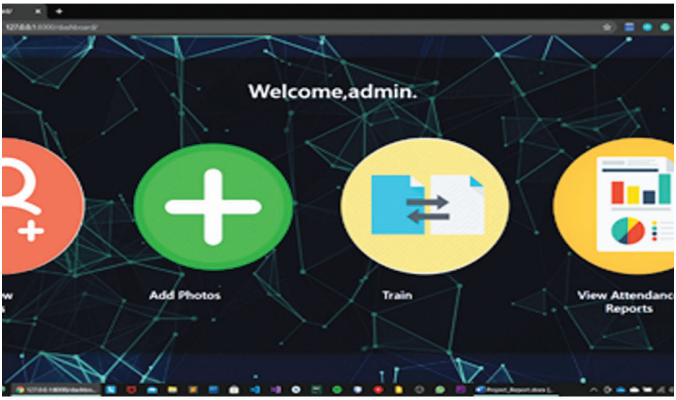
SYSTEMS IMPLIMENATION

This is guided by the screen shots of every stage of the system's implementation



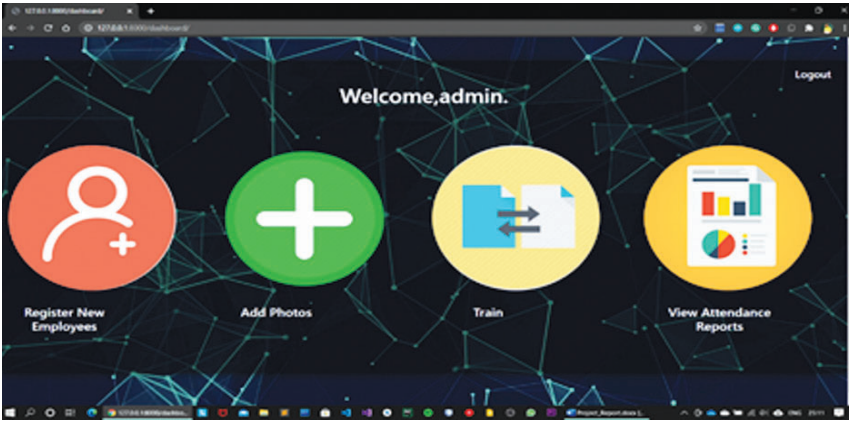
Picture 1: showing biometric face recognition attendance system home interface

This is the home of the system containing three components. Mark your attendance in for registered users of the system on arrival to the health facility for work. Mark your attendance out is for departure and login works for both admin and the users on providing their credentials.

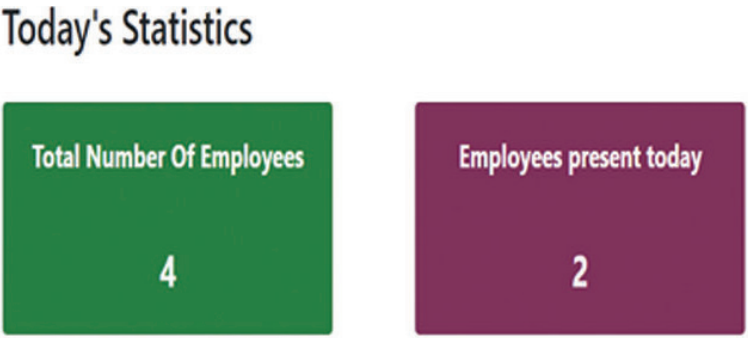


Picture 2: showing biometric face recognition attendance system Admin interface

When you login as admin, you get in to the above interface. Admin is able to register new employee, Add the photos of the new employee, Train the photos of the new employee and is able to view the attendance reports of all the employees



Picture 3: showing the biometric face recognition attendance system input fields for registering new employee .



Picture 4: showing biometric face recognition attendance system for admin to view the attendance of employees

DISCUSSION, RECOMMENDATION, FUTURE WORK AND CONCLUSION

DISCUSSION.

Basing on the findings from the research study, there are a lot of things that are discovered from the study. To start with the response rate, it was good though not to the best of the expectation of the researcher. Also there are some factors that limited the response rate to the extent it was. No matter the rate at which the respondents responded, a lot of information that led to development of the idea of coming up with the system in question. According to several studies through all the techniques with observation included, it is estimated that the absenteeism rate of health workers in hospitals Mengo, Mulago and Nsambya is 40.12%, 37.98% and 40.42 respectively, which is a very high number to be considered and can cause a very high effect negatively to the health institution since there are many patients who need the attention of the health workers, there by leaving the few health workers present with much work load against the lives of the patients since some patients will remain un attended and yet they need immediate attention for treatment.

The problem above is proved by the responses given by patients of different hospitals when asked about what problems they face while being In hospital. In Mengo hospital, 52.0% of the questioned patients responded of patients not being attended, 40% of Mulago patients responded the same answer and 32.8% of the Nsambya Hospital gave the same. This is caused by the health workers absenting themselves and at times absconding from duty and there-fore leaving the patients un-attended. It is realized by studies that there are high death rates in public health institutions than private health institutions and these are caused by such situations where by we lose our beloved pregnant mothers and other sick categories because they are not attended on time.

This is also proved by the questionnaire given to the health workers of respective hospitals about what causes high death rates in public hospitals than private hospitals. Among the reasons given in the questionnaire, here are the results given by the health workers of those respective health institutions. 65.7% Health workers of Mengo Hospital said it is due to un attended patients, 57.1% in Mulago said the same and 67.3% from

Nsambya hospital gave the same response. Considering the number of health workers In these hospitals, patients could not be going through this main situation where by they are not attended yet they need immediate attendance for treatment. A secret interview was conducted with the security personnel of the location and their response is that most health workers leave duty at the time they are not supposed to leave and others come at late hours while others develop their programs and miss coming for work.

This is caused by the fact that the top authority within the health units harmonize with the workers and allow them have un necessary freedom which turns to affect the patients who need medical attention. Coming up with this system is for the fact that it records the attendance of the health workers every day as they report and leave the premises. It also records the arrival time and the departure time to make sure that the workers leave at the required time

RECOMMENDATIONS.

I recommend the study to distributive be conducted in different regions of the country in different health institutions in order to come up with uniform information about which challenge is to be addressed from the health institutions. I also do recommend the research and the development of systems that focus on different other biometrics like finger print and others, this research was strictly confined to face recognition among the several biometrics. Finally, we recommend ample time allocation in order to properly conduct research and design the quality system that is aimed at solving the given problem.

CONCLUSION.

Face recognition attendance systems are part of facial image processing applications and their significance as a research area are increasing recently. Implementations of system are on crime prevention, video surveillance, person verification, and similar security activities, attendance monitoring among others. The face recognition system implementation will be part of human aid robot project at different Universities across the world. The goal is reached by face detection and recognition methods. Knowledge-Based face detection methods are used to find, locate and extract faces in acquired images. Implemented methods are skin color

and facial features. Neural network is used for face recognition. RGB color space is used to specify skin color values, and segmentation decreases searching time of face images. Facial components on face candidates are appeared with implementation log. Log filter shows good performance on extracting facial components under different illumination conditions. The application of this technology in systems is necessary to different institutions across the world as it is easy in monitoring the attendance of the staff within the organization and the arrival time of the workers monitored. The workers will be motivated to always attend their duty and also attend within their time of reporting to duty

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