Deterring Malpractice in a Networked Computer Based Examination Using Biometric Control Attendance Register

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---ABSTRACT---
In recent time students are currently adopting various examination malpractice method. The most rampart among the approach is impersonation which cannot be easily detect especially in a very large class and conspiracy of some invigilator or teachers. This research is focused on design of biometric control examination attendance register to deter impersonation during examination. There are various approach to biometric usage which include the fingerprint, face recognition, DNA, hand geometry, iris recognition, retina etc. This research work adopted face recognition biometric technology that recognized different faces. Database of the captured image was built through the use of K-means/hierarchical algorithm model and EM algorithms to initiate and refining the database model respectively. Face recognition was done via skin segmentation, candidates face search, and verification, while face recognition was carried out by face image processing and classification. The entire process was coded using java.net and the resulted system was tested with return shows significant accuracy of recognition test for candidate/students used in the training and testing phase.
Keywords: Biometric control, deep learning algorithm, examination malpractice, *Face Detection and Recognition.*

I. INTRODUCTION

Examination is a test to measure learner's knowledge, in recent time some of this examination are been conducted through computer system due to the population of students and proliferation of computer system. Generally examination malpractices is major problem that debar the integrity of the result of examination or product of the institutions [1].

In Nigeria for exam the entrance examination to the higher institution popularly known as JAMB is has is currently been done online. Interview for job placement in some cooperate organization are currently been conducted through computer system, also some schools are currently adopting CBT examination especially for general courses. CBT exams has many advantages such as timely release of result, reduce interference by the examiners or invigilator to abet malpractice. Some students with phobia for the CBT examinations because of one reasons or the other uses third part to write the exams for them especially where the attendance register is done manually and there is little or measure to control the students login to the examination system in the computer room. Use of PIN personal identification is the common approach currently in used which can be given to the impersonator to sit and write examination for the other student[2]. Some of these PIN numbers are generated by the institution or examination body which students used to login and do the exams. Biometric approach could give a best method to deter examination malpractice thorough the use of impersonator. Face Recognition Technology is widely used in various applications and candidate can be identified via facial features been extracted and implemented by using on algorithms or the others[3]

This research work present the design of biometric control examination attendance register, that will be embedded into the CBT computer system using face recognition to be implemented with deep learning algorithms. In this approach, students still uses the code or examination PIN to access examination system or paperless examination but cannot proceed or commences examination until he or she passed face recognition test by the system which is made up of two modules, face detector that captures student faces and stores them in a file using *deep learning algorithms*, and face recognition module that compare and match the captured images (faces) in the file with the students to attend the examination.

II. LITERATURE REVIEW

A. Approaches To Examination Malpractice

"Examination malpractice is any form of cheating before, during or after examination. There are different forms of examination malpractice which range from Copying from pre-prepared answer sheet; Colluding with other students to get the right answer; Copying from another student's test, impersonation etc"[4, 5, 6].

B. Biometric System and Examination malpractice

"Biometric Access is a better substitute for the use of Identity card or PIN in verifying user's identity for examination or any access control system"[7] "In recent time biometrics (fingerprint) have proven to offer a good and reliable way of automatically verifying students for an examination, especially for large classes where manual facial recognition of every student will not be practical to avoid student impersonation during examination or tests" [8] Biometrics is applicable in the school system to curb

examination malpractices by using it as gate control system to examination hall **[9].**

C. Face Recognition system

Face recognition system is biometric technique that uses combination of face detection and recognition for the purpose of identity recognition. The face recognition system uses a combination of techniques in two topics; face detection and recognition. In this biometric approach live image of intend or future user will be acquired, and face detection is performed acquired images for recognition and identity pass. Processes often utilized in the face recognition system"are white balance correction, skin like region segmentation, facial feature extraction and face image extraction on a face candidate" **[10].**

III. METHODS AND MATERIALS

The proposed system is made up of a camera that internments images of the students and propels the captured image to the image enhancement module. Subsequentlythe enhance images compare with those sitting or the examination (Face Detection and Recognition)modules. The attendance will then marked on the database server. The face recognition approach used in this research work is depicted in the figure 1 which comprises of Image acquisition; Upgrade Contrast; Skin classification; Connected Region Analysis; Face detection; Face recognition; Attendance, we adopted K-means/Hierarchical clustering algorithms and EM algothms and coded the algorithms with visual basic.net. The application was then installed on the CBT computer system for the purpose of face recognition and identity pass. The flowchart chart for the implementation is shown in figure 2.
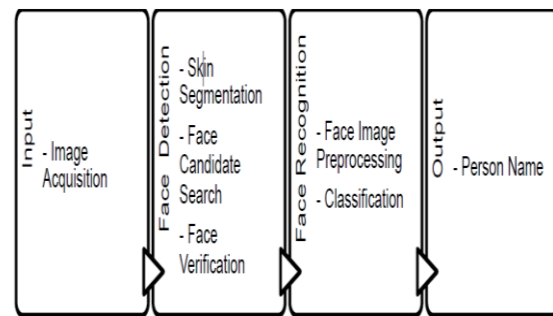

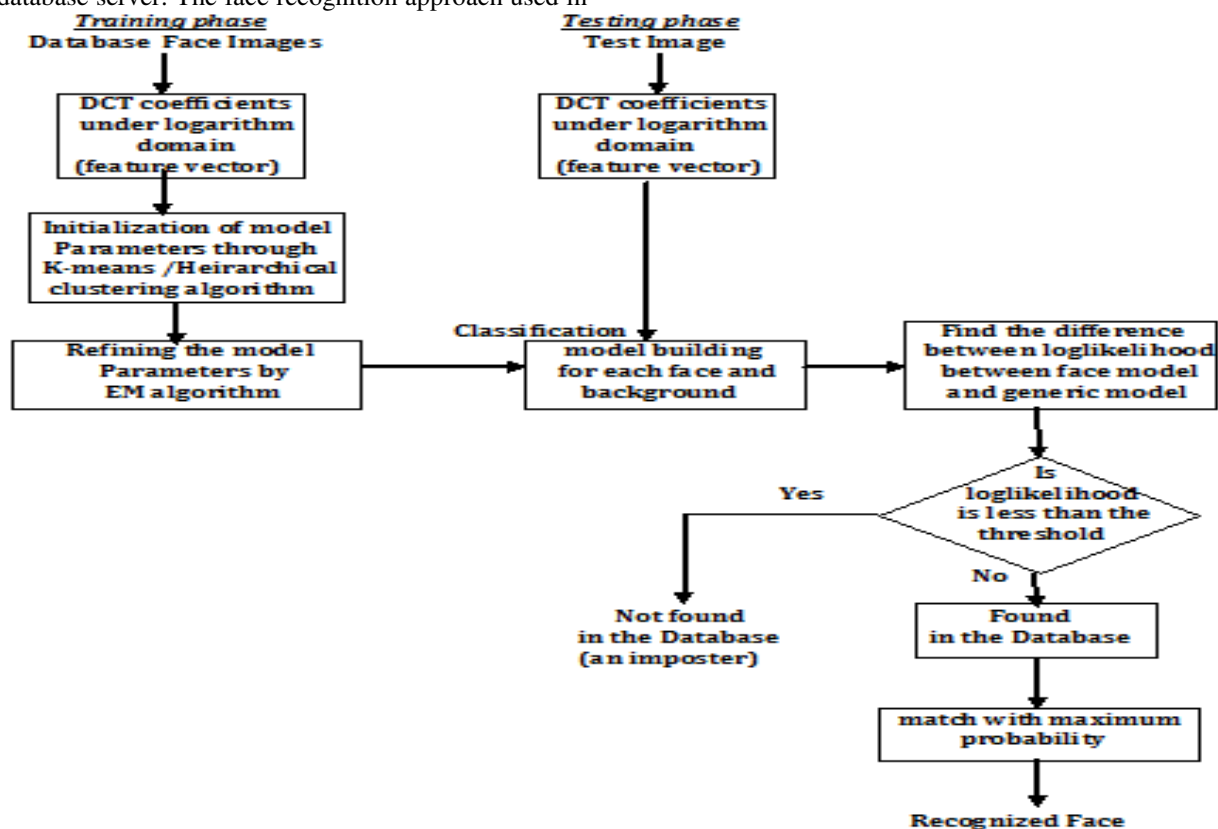*Figure 1. Face Recognition Approach*

Figure 2 Algorithm of the Proposed Face recognition System

The proposed system working processes includes: Image Acquisition, and feature extraction in the training phase, and Face Recognition in the testing face. Student logon to the examination system with his or her PIN or matric number, but will only get access the examination paper when passed Face recognition biometric test. This implied that such student facial image ought to have been acquired taken into consideration the facial recognition parameters. Algorithm was implemented and tested using selected students with the following result as shown in the user interface of the output.

The methodology described was implemented. The system was tested with a Train set of 14 images already trained and stored in the face database and was evaluated based on

the train set provided. The system was able to accurately recognize images of students from the database and marked attendance for match students and unknown students are tagged unknown by the face recognition algorithm. Figure 3 – 8 shows screen short during the testing faces for face recognition. The result shows that the system is efficient and accurate method of attendance in the classroom environment that can replace the old manual methods.
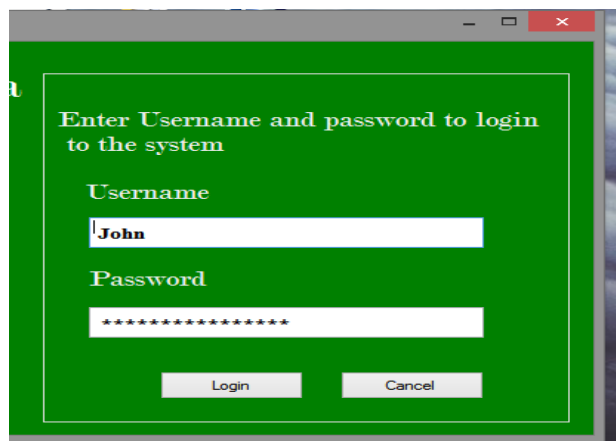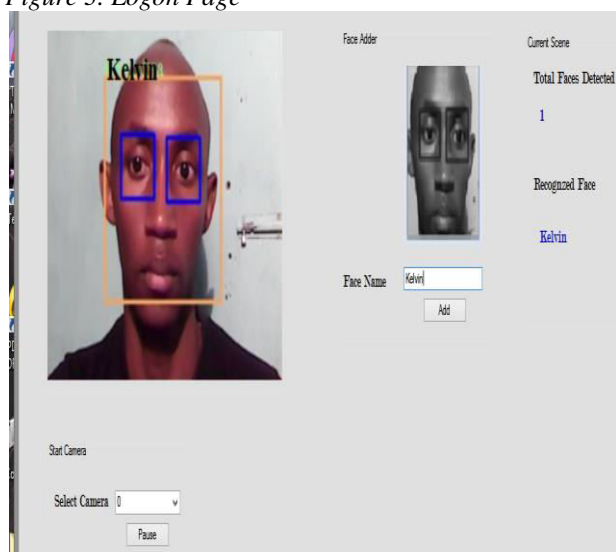

Figure 3. Logon Page
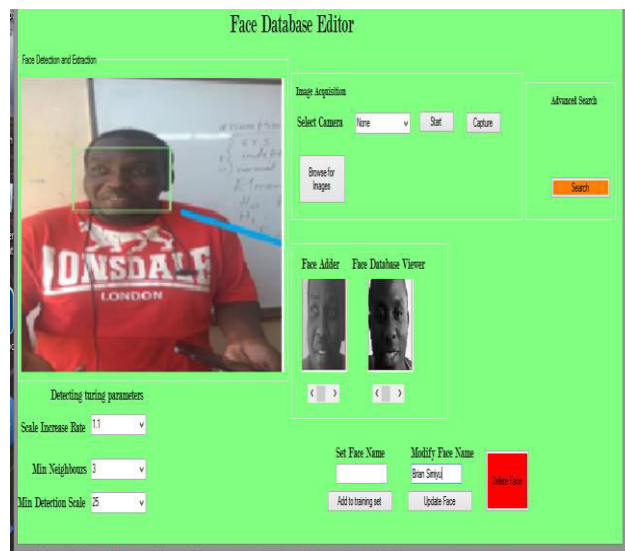

Figure 4 Input Feed Window

Figure 5 Face Editor Database

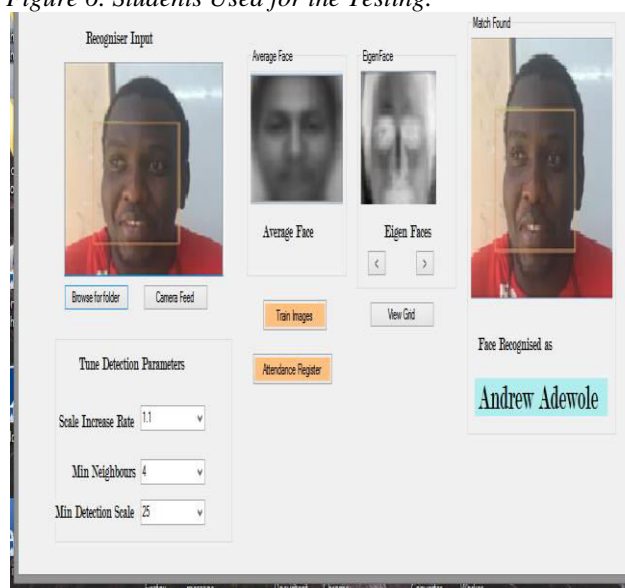*Figure 6. Students Used for the Testing.*
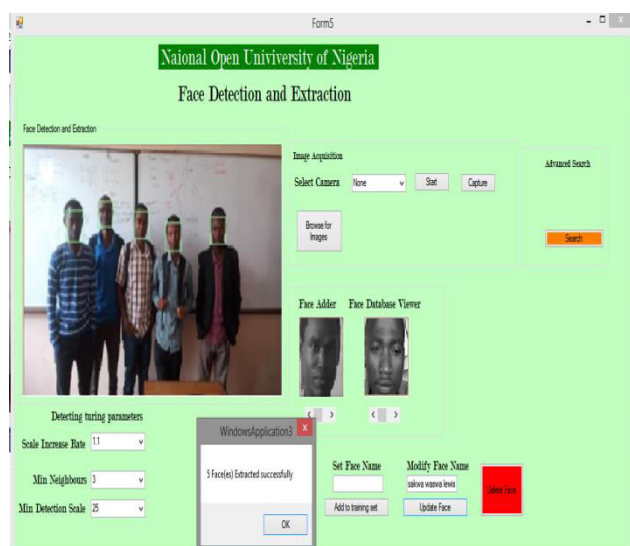

Figure 7Face Recognizer Page

Figure 8Face Detection and Extraction page

IV.   CONCLUSION

Face recognition of Biometric techniques is part of facial image applications with increasing research area and integration. This research work deployed facial recognition to deter students from impersonation during examinations which is rampart in some schools. The two major phases was carefully designed for the attainment of the goals of the application. Database of the captured image was built through the use of K-means/hierarchical algorithm model and EM algorithms to initiate and refining the database model. Face recognition was done via skin segmentation, candidates face search, and verification. The face recognition was carried by face image processing and classification. The entire process was coded using visuabasic.net. Developed face recognition system was installed on server of the networked CBT computer networked set-up by the researchers for the purpose of the research work.The system was tested and the result return shows significant accuracy of recognition test for candidate/students used in the training and testing phase.

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