

Strategies and Contributions of Biometrics in E-Learning

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Abstract—Biometric technologies are available today that can be used in many systems to help people in their life. Biometric technologies vary in complexity, capabilities, and performance and can be used to verify or establish a person's identity.

This research aims to clarify the relationship between the biometrics and e-learning. And the different biometric technologies that are being used in e-learning.

Keywords- biometric, e-learning.

I. INTRODUCTION

In our life, there are many devices and tools using biometric technologies. So, you can find smart mobile open by fingerprint, laptop work after you enter your retina, doors open after check your hand geometry! The people prefer to use these devices because it save their time and avoid the word sorry I forget my visa card for example.

Biometric technology are automated methods for identifying a person or verifying a person's identity based on the person's physiological or behavioral characteristics which include fingerprints, hand geometry, facial, voice, iris, and retinal features; behavioral characteristics include the dynamic signatures and keystrokes.[2]

Any physical trait that can be reliably measured can be used to authenticate and for identification and such procedure is called a biometric. Like a fingerprint, face, retina. If someone is authenticated based on some physical trait, then biometric recognition is used. [1]

In this research, we tried to highlight the contribution of biometric technologies to e-learning. This aims to give the researchers and others people road map and engage them to used first and secondly try to find another kind of support from biometrics. Describe the relationship between these areas maybe gives other people new ideas to develop and support it. The research will talk about the support and assistance from biometric technologies to e-learning and explain the relationship between the two areas.

II. RESEARCH PROBLEMS

The biometric technologies is used to identify or verify a person and this reason makes it very useful in electronic learning because procedures and the parts of e-learning need both operations. So we can describe the problem of this research through the answers for the following questions:

- What are the contribution and supports from biometrics to e-learning?
- In which part or stage of e-learning used biometric technologies?
- What are the better(suitable) biometrics technologies used in e-learning?

2. RESEARCH PROBLEM

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3. RESEARCH OBJECTIVES

1. To identify the relationship between biometric technologies and E-Learning.
2. To determine in which stage in e-learning needs biometrics technologies.

3. To find which are suitable biometrics technologies with E-Learning.

4. Literature Review

There are many areas need for biometrics beyond homeland security. The network security infrastructures, secure electronic banking, investing and other financial transactions, retail sales, law enforcement, and health and social services already benefit from these technologies.

Recently, it has become been proven that e-learning is very important and in recent times, most people have begun to respect this type of learning, which now leads to the question, what is e-learning? When it comes to education, the model has been pretty straight forward as up until the early 2000's, education was in a classroom and this comprised of the students with a teacher who led the process. Physical presence was a non-negotiable, and any other type of learning was questionable at best. Then the computer evolution happened and it radically changed the learning landscape. In essence, e-learning is a computer-based educational tool or system that enables you to learn anywhere and at any time. Today e-learning is mostly delivered through the internet, although in the past it was delivered using a blend of computer-based methods like CD-ROM. [2].

5. Previous Studies

Ki-Sang Song and other they are said [3]

Because of the weak authentication system to get permission to access e-learning contents or more sensitive contents such as tests, an advanced remote authentication system is necessary due to the limitation of one-time authentication based on password or personal identification (PIN). To provide the continuous personal identification, we present the possibility of cognitive biometric applications by combining both eye tracking and event relevant potential (ERP) signal of brain waves. To show the possibility of ERP 300 application, the experimental results of gender differences to information technology terminologies presented as target stimulus, and the analyzed results show that P300 can be useful as a continuous authentication method in e-learning systems.

Sara Jeza Alotaibi she was said [4]:

E-learning is a great opportunity for modern day era. Notably, however, the tool needs to be coupled with efficient and reliable security mechanisms to ensure that the medium can be established as a dependable one. Authentication of e-exam takers is are of prime importance, so that exams are given by fair means. A new approach shall be proposed so as to ensure that no unauthorized individuals are permitted to take part in the exams.

Yair Levy and other they said that [5]:

In the past fifteen years, the use of Internet technologies has been substantially growing for the delivery of educational content. E-learning environments have been incorporated in many universities for the delivery of e-learning courses. However, opponents of e-learning claim that a central disadvantage of such teaching medium is the growing unethical conduct in such environments. In particular, opponents of e-learning argue that the inability to authenticate exam takers is a major challenge of e-learning environments. As a result, some institutions proposed to take extreme measures, including asking students to take exams in proctor centers or even abandon completely the offering of e-learning courses in their institutions. This paper attempts to address this important problem by proposing a theoretical approach that incorporates available fingerprint biometrics authentication technologies in conjunction with e-learning environments to curb unethical conduct during e-learning exam taking. The proposed approach suggests a practical solution that can incorporate a random fingerprint biometrics user authentication during exam taking in e-learning courses. Doing so is hypothesized to curb exam cheating in e-learning environments. Figures and Tables

6. Research Methodology

At the beginning, we need to define what are the E-Learning components or parts that can be supported by biometric technologies.



Find the table no.1 it shows the relationship between E-Learning and biometric technologies which are used by its components.

The biometrics technologies Vis e-learning parts

Biometrics system can be used in any one of the two modes:(Verification or Identification) depending on the application, the first mode is verification, also called authentication, it is used to verify a people identity, that is to authenticate that individuals are who they say they are. The second mode is Identification, it is used to establish a people identity, that is to determine who he/she is[6].

First: biological biometrics

a. Fingerprints:

Its biological biometrics, which are wildy used in our life. It is an older biometrics technology and there are many modern electronic devices supporting it. In addition, it is easy to connect the devices with computer and it is inexpensive. In brief, for this reasons the fingerprints used in many parts in e-learning like registration, e-attendance, e-assessments (e-exams) and other parts.

b. Face Recognition:

It performs better in verification, but not at the accuracy rates that are sometimes claimed. Some application uses this type of biometrics in the synchronize e-learning so, some people use it in Assessments "E-exam" or "E-Attendance" parts of E-Learning.

c. Voice Recognition:

It is not prevalent biometrics because it need special environment during the enrollment phase as well as the verification or identification phase.

Second: behavioral biometrics

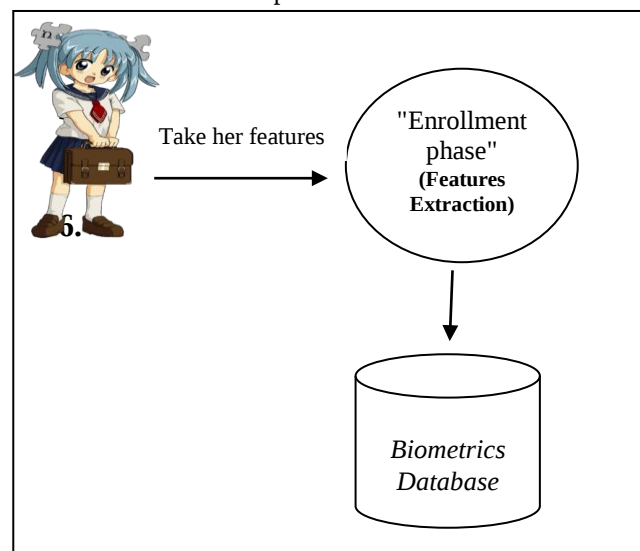
1. **Keystroke:** they are used in many E-learning components like the registration, assessments, attendance, and authentication during the learning, and for administrative purposes.
2. **Signatures (on –Line signature):** it is better to use it with E-attendance, registration, and administration.
3. **Lip motion:** it is perfect if it is used in oral online exam for verification purposes.
4. **Holography** (on-line Handwritten): it can be used in E-Assessments.

Table 1: E-Learning Components and Biometrics

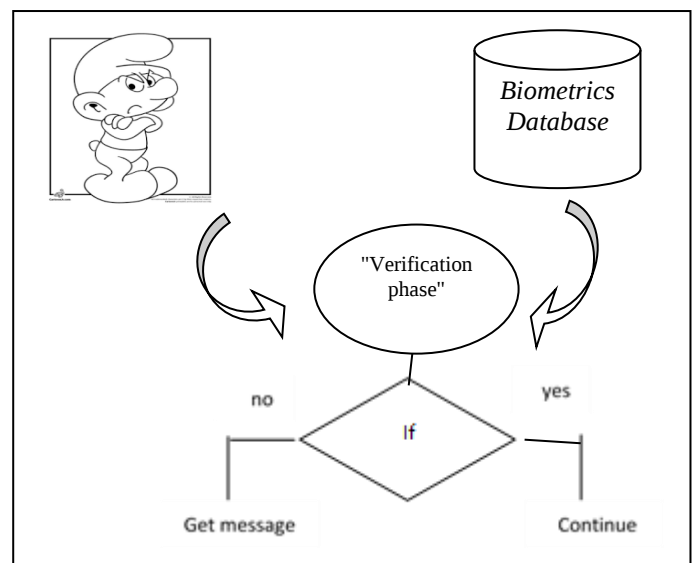
<i>E-learning Components</i>	<i>Biometrics Technologies used</i>
Registration	Fingerprints, face, retina. "enrollment phase"
Authentication During the Learning	Face recognition using web camera "identification/verification"
Assessments "E-exam"	Fingerprints, face recognition using web camera "verification"
Attendance "E-attendance"	Fingerprints, face recognition "verification"
Administration Systems	Fingerprints, face, retina. "identification/verification"

Research procedures

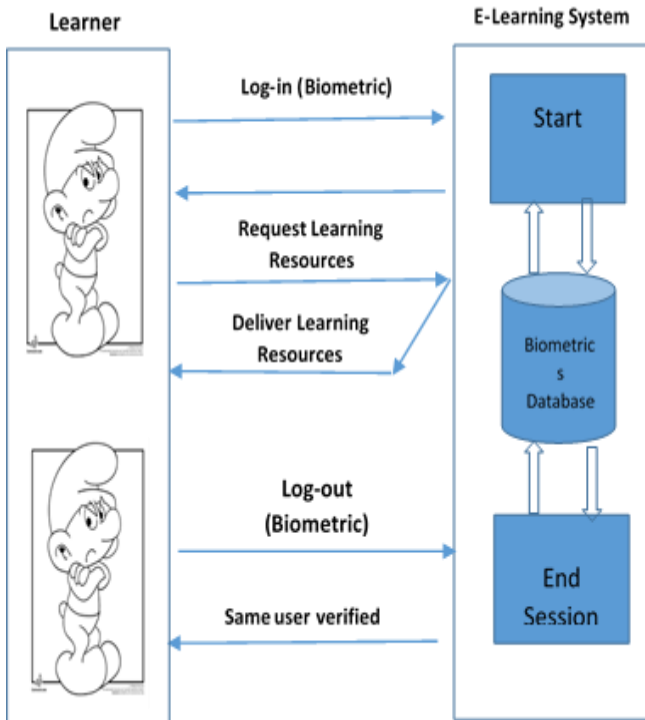
Phase1: Enrollment phase.



Phase2: verification phase



LEARNER SEQUENCE DIAGRAM



6.RECOMMENDATIONS

- E-Learning is supported by biometric technologies in many parts or components.
- There are different types of biometrics; biological biometrics can be used in E-Learning environment.
- Using biometric technologies in E-Learning give it more validity and reliability.
- Engage the researchers to focus on the biometric technologies and explore which are better to use in E-learning while knowing the E-learning components in detail.

7. CONCLUSION

In conclusion, biometric technologies need to increase in many applications in our life. In this paper, the researcher explains and determines which part of E-Learning biometrics can be used. And suggests new types of biometrics technologies that can be used in E-Learning.

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