

Security and Biometric Devices

Sponsoring Faculty: Dr. Rose Shumba

Students: Melissa Karolewski, Lindsey Bertugli, Jennifer Hiserrod, Tamara Smith

Computer Science Department
Indiana University of Pennsylvania

General Project Description

The general public is often isolated from the techniques in information security, yet the security of cyberspace rests on the security of all its components. The goal of this project is to investigate the public's understanding and acceptance of biometric devices as a method of user authentication. Investigators will test the security of some existing biometric devices and then through a questionnaire survey investigate the understanding and acceptability of biometric devices among the IUP community. The output from this project will be disseminated through conference presentations.

Such a project, if successful, will: 1) enhance investigators' knowledge and understanding of information security and biometric devices, 2) enhance IUP community's awareness of biometric device and their application in security. 3) spawn research projects regarding biometric devices, and 4) enhance the public's confidence in the use of biometric devices as an access control device.

Specific Questions/Hypothesis

1. What are the available biometric devices?
2. How are the devices used for user authentication?
3. Are current biometric devices an effective form of user authentication and access control?
4. Are biometric devices ethically acceptable?

Methods

The investigators will carry out the following tasks:

1. **Background Theoretical Research:** The investigators will do some background research on available biometric devices and related theory:
 - i. Access Control
 - ii. Authentication & Verification
 - iii. Current Types of Biometric Devices
 - a. RFID's (Radio Frequency Identification Devices)
 - i. Implantable
 - ii. Non-implantable
 - b. Smart cards
 - c. Iris Recognition
 - d. Fingerprint Recognition
 - e. Voice Recognition

We will use the websites listed in our references to get a thorough knowledge on biometric devices. A background research report will be produced.

2. An evaluation of the effectiveness of currently available biometric devices: The evaluation will involve

- a. Developing some criteria for selecting the devices for evaluation.
 - b. The development of the testing procedure and the related justification for the procedure
 - c. Documenting the results from the evaluation.
3. **Determination of the acceptability of the use of biometric devices:**
Investigators will design and administer a questionnaire survey to the IUP community. The aim of the questionnaire is to gather data on the IUP communities' knowledge of the existence and acceptance of biometric devices. Approximately, 550 members of the IUP community will participate in the survey. Results from the survey will be analyzed to determine the acceptability of the devices including ethical concerns.
4. **Development of conference and departmental colloquium presentations:**
From the evaluation a paper for a conference presentation will be produced. This presentation will contain both the concerns with biometric devices, as well as the research conducted by the investigators. A colloquium on this work will educate the IUP community and computer science students of the current steps and concerns with biometric devices and security.

References

1. <http://www.biometrics.org/>
2. http://www.cc.gatech.edu/classes/cs6751_97_winter/Topics/quest-design/.
3. <http://tibs.org/biometrics/>
4. <http://biometrics.cse.msu.edu/>
5. <http://www.biometrics.dod.mil/>
6. <http://www.idlinksystems.com/>
7. <http://www.ringdale.com/accesscontrol/>
8. http://www.homesecuritystore.com/ezStore123/DTProductList.asp?p=2_1_1_1_0_0_191
9. <http://www.c4ads.org/?gclid=CL-4nfHw5YQCFQQdSAodET5ejw>
10. <http://www.networkworld.com/research/biometrics.html>
11. http://www.pcmag.com/encyclopedia_term/0,2542,t=biometrics&i=38651,00.asp
12. <http://en.wikipedia.org/wiki/Biometric>
13. http://en.wikipedia.org/wiki/Biometric_passport
14. http://en.wikipedia.org/wiki/Facial_recognition_system
15. <http://en.wikipedia.org/wiki/RFID>
16. http://www.rfidgazette.org/2005/08/implantable_rfi.html
17. <http://www.verichipcorp.com/>
18. <http://www.iris-recognition.org/>
19. Clarke, V., Teague, G., Siann, G. Gender and computing: Persisting differences, Educational Research, 37, (21).
20. http://www.biometricgroup.com/reports/public/reports_iris-scan.html
21. <http://www.digitalidworld.com/modules.php?op=modload&name=News&file=article&sid=98>

Impact on the goal of CREU

The successful completion of this project will:

1. Provide a positive research experience for a team of undergraduate female students majoring in computer science.
2. Advance the knowledge and understanding of information security issues with biometric devices by the investigators through the stated background research and the evaluation of biometric devices.
3. Provide an environment for exchange and dialog among the participating female investigators and the faculty. This will give value to women's' learning styles, skills and strengths. Many research studies report that males often prefer to work alone on computer problems, whereas females prefer to work collaboratively in groups where they can explore the problem verbally. [19]
4. Encourage participation by female students in very unique computer application areas, information assurance and biometric authentication. It is believed that an exposure to a wide range of computer applications can help develop an appreciation of the uses of computers by female students.
5. Present information assurance and biometrics in a context that emphasizes its social relevance. Research shows that women are more likely to choose and enjoy information technology subjects if they are presented in such a context [19].
6. Increase level of confidence by the workshop participants through hands-on exercises.
7. Enhance communication and presentation skills for the investigators through presentations of research.

All the above will contribute towards the generation of interest and enthusiasm among the investigators and presentation attendees hence motivate them into considering further studies in computer science. This is in line with the goal of CREU, to increase the number of women who continue on to graduate school in computer science.

Finally, the sponsoring faculty is a female whose research interests are in information assurance and gender and computer science. The faculty acting as a mentor will encourage the investigators to seriously consider pursuing graduate studies in computer science.

Student Activity and Responsibility

All the students will be involved with all the activities; however one student will be responsible for the successful completion of the activity.

Time	Student Activity	Student Responsible
Fall 2006	Background research report	Melissa Karolewski, Tamara Smith
	Design of questionnaire	Lindsay Bertugli
	Questionnaire administration	Jennifer Hisserodt, Tamara Smith
	Evaluation of techniques & devices	Melissa Karolewski & Lindsay Bertugli
	Production of reports	Jennifer Hisserodt
Spring 2007	Development of biometric testing procedures	Melissa Karolewski & Jennifer Hisserodt
	Presentation of results	ALL

Summer 2007 (May)	Final research report	Lindsay Bertugli, Tamara Smith
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Faculty Activity and Responsibility

1. Read and comment on the background research report.
2. Help with the design and administration of the questionnaire and assist with the IRB process.
3. Work closely with the students during the evaluation of the biometric devices and techniques to identify the “best of the breed” tools and techniques.
4. Work closely with the students during the integration of the biometric devices and techniques.
5. Help with the production of the workshop announcement and its distribution.
6. Help with the implementation of a presentation.