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Finger gesture authentication system using touch screen devices

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Abstract: Hand gestures are a form of communication among people. Yet we still limit human-computer interaction to cumbersome mice movements. The use of hand gestures in the field of human-computer interaction has attracted new interest in the past several years. To further enrich the naturalness of the interaction, different computer vision-based techniques have been brought into use. At the same time the need for more efficient systems has resulted in new gesture modeling approaches. In this Project we present a review of the most recent work related to hand gesture modeling, analysis and synthesis. We describe five hand gesture techniques: Flick, Rotate, Drag, Pinch, Spread that use drawing gestures, and other gesture analysis technique. We present a FAST authentication technique. We take advantage of the multi-touch surface. We defined a comprehensive set of five-finger touch gestures, based upon classifying movement characteristics of the fingertips. FAST Authentication technique provides more security and ease authentication. This technique can be used every were where there is need of secure authentication ,in contrast to typical text-based passwords FAST authentication is more secure. Based on these results, we conclude that multi-touch gestures show great promise as an authentication mechanism.

Thus the proposed system has the ability to provide security to data, preserve the data from unauthorized access and thus provide a very reliable, safe and effective way to guard and share user data.

Keywords: touch-screen device, gestures, Pythagoras theorems.

Introduction

Gestures are a powerful means of communication among humans. In fact, gesturing is so deeply rooted in our communication that people often continue gesturing when speaking on the telephone. Hand gestures provide a separate complementary modality to speech for expressing ones idea. Information associated with hand gestures in a conversation is degree, discourse structure, spatial and temporal structure. So, a natural interaction between humans and computing devices can be achieved by using hand gestures for communication between them. Our project mainly consist of following features:

1). User Authentication
2). User Registration and Gesture Selection
   a. User has to select gestures to be used for authentication on phone.
   b. User has to select the gestures and order of the gesture needs to be defined.
3).Gesture authentication Module
   a. Collecting Gesture Data from User.
   b. Analyzing gesture data to detect the shape.
   c. Shape can be flick, pinch, spread, drag and rotate.
   d. User has to draw same no. of gestures and in the same order that are selected during registration process.

4). Minimization-maximization: If a user is accessing his account and temporarily he suspends his work minimizes his screen and goes away, after he gets back to work and maximizes the screen he has to enter the valid gestures as an additional security.

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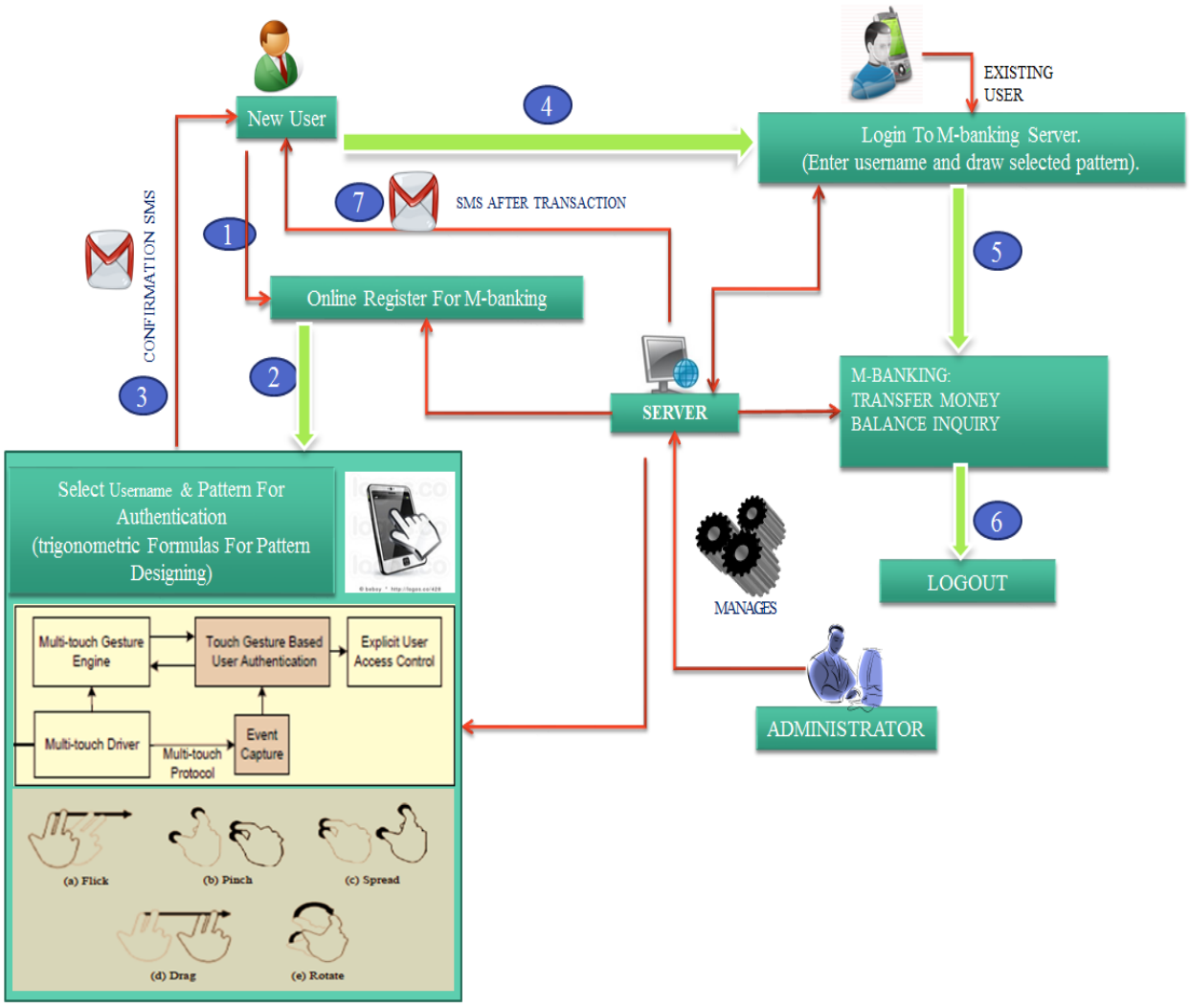
Objectives

The main objective of the project is to use gestures on touch screen devices as an authentication media. This project introduces FAST (Finger gestures Authentication System using Touch screen), a novel touch screen based authentication approach on mobile devices. This project extracts user's touch screen co-ordinates and matches it with database signs.

Architecture



Algorithm

1. Enter user name and select minimum two gestures from provided pattern.
2. System will recognize user's drawn patterns as follows-
3. System will detect two points and then record distance between two points on the screen.
4. According to user's entry:
5. If distance between two points:

    a. Increases then it will be spread and distance will be calculated by using trigonometric formulae.
    b. If one point on the screen is static and other has constant varying position then it will be rotate.
    c. Decreases then it will be pinch and will be calculated by using trigonometric formulae

Current Methodology

We often do online transactions like credit card payment , fund transfer, online shopping from websites that are registered to bank and when the end user want to do transaction by logging into his bank account which contains user name and textual passwords.
But its quite often that credentials entered by end users can be captured by attackers using different techniques. Therefore textual passwords do not provide more security to users confidential data.

Proposed system

We are proposing a new methodology to provide end user greater security and reliability with the help of gestures.

Operating environment

The software is an android based application that is to be deployed on touchscreen devices.
The application can be operated on any touch-screen devices that have Android operating system.

Technical specification

Advantages:

- It is gesture based authentication.
- Avoid shoulder surfing attack
- Avoid phishing.
- It provides people great pleasure and new experience which traditional interaction could not offer.
- Helpful for illiterate people

Conclusion

FAST provides enhanced security for mobile systems by using touch gestures as input. FAST improves the security protection by using post-login authentication protection mechanisms.

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