



PERCEPTUAL USER INTERFACE AS AUTHENTICATION METHOD IN MOBILE BANKING

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ABSTRACT:

For the last decade, banking has taken a new form, banking at customer's own location. Mobile banking has come into view as a powerful provider of bunch of banking services. The worldwide adoption of mobile banking will depend on the secure, reliable and effortless user interfaces. In recent years, M-banking has emerged as the main division of e-commerce and m-commerce. Hand gesture password might be the most native and intuitive way to communicate between public and machines, since it closely mimics how human beings interact with each other. Its intuitiveness and naturalness have seeded many applications in exploring mass data, computer based games and video games, virtual reality, health care, etc. In this paper, we apply their gesture in order to login or authenticate to the system. After that, we introduce a novel method to produce a gesture pattern that act as a password.

INTRODUCTION

A new communications technology is redefining the union of communications and computing. Mostly banks are using secure payment gateway as well as security measures, which increases their cost and infrastructure for their bank. But major day-to-day banking activities are not only payment transfer but inquiries, notifications and alerts as well. The innovation of relatively cheap image and depth measuring sensors has stimulated research in the field of entity tracking and gesture recognition.

This Gesture Password Recognition will require consumer to capture the gestures by point up and moving up/down the fingers or hand in front of the sensor without need to use a keyboard or mouse to put password and the gesture itself act as password alone[1].



PERCEPTUAL USER INTERFACE

Actually, Gesture recognition is the mathematical interpretation of a human body motion by a computing device. Gesture recognition, along with the related facial recognition, voice recognition, eye tracking and various ways lip movement recognition are components of what developers call as a perceptual user interface (PUI).

The prime goal of PUI is to enhance the efficiency and ease of use for the user for the underlying logical design of a stored program[2]. Recognizing gestures as input password allows computers to be more and more accessible for the physically-impaired and makes their interaction more natural in a gaming or any kind of 3-D virtual world environment.

Actually, Hand and body gestures can be amplified by a special controller that contains accelerometers and gyroscopes to sense tilting, various rotations and acceleration of movement -- or the computing device can be equipped with a camera so that software in the device can identify and interpret specific gestures.

For this gesture based games and applications, the most natural way to interact with the system is by able to recognize the gesture of a user[3]. A special camera is designed to detect the body pose and not hand gestures which required more precise algorithms for the same.

This venture will focus on testing efficient, resourceful and accurate algorithms in detecting the fingers as a replacement for a traditional password.

Combination of symbols are entered by users by using a finger. The dimensions used to represent the password are the outline of each symbol, and the time taken when doing all of the traces. Using this representation, the user is enforced to think of and memorize passwords in a more qualitative manner, and is also disallowed from using bad habits such as storing passwords in text files. This gesture based password recognition system consists of using the user finger to enter a pattern into this grid.



PROTECTION FROM KEY LOGGERS

This mechanism is far more to preserve from key logger threat or brute force attack and also man in the middle attack. Credit cards number, bank unique account's number, password or anything that can be key in with keyboard are being capture as typing text. This log will be used by third party to steal money, fraud and many more control that cause loses to the permissible user. In this procedure, password kept in the gesture pattern in some way.

There is no password disclosure from user to anyone. In other words, there is no typing text information that can be capture by key logger[4]. Along with that benefit, this proposed system will not cause user from forget their created password.

Gesture based password are mainly used in mobile phone and tablet such as iPhone, iPad as well as Android for using mobile banking etc. For Microsoft's new Windows 8, Microsoft is planing a new way to log in to tablet PCs by allowing users performs gestures on the screen instead of traditional typing in letters and numbers[5].

A user will choose a photo (from a series of photos) with some personal meaning to them. Among the kinds of simple passwords, the gesture-based system can prove to be more secure for almost fields.

MATERIALS AND METHODS

The proposed Gesture Password Recognition, need user to use their gesture to perform login or authenticate to the system.



- USB 2.0 interface (Hub)

- Data

- Depth
- RGB
- Audio out
- Audio in
- Tilt

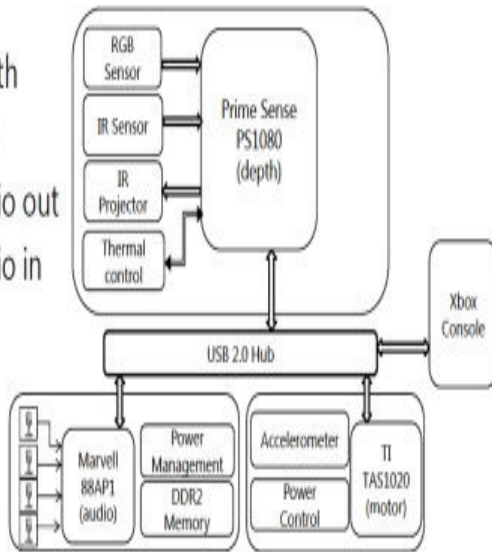


Fig.1: Gesture Recognition Components.

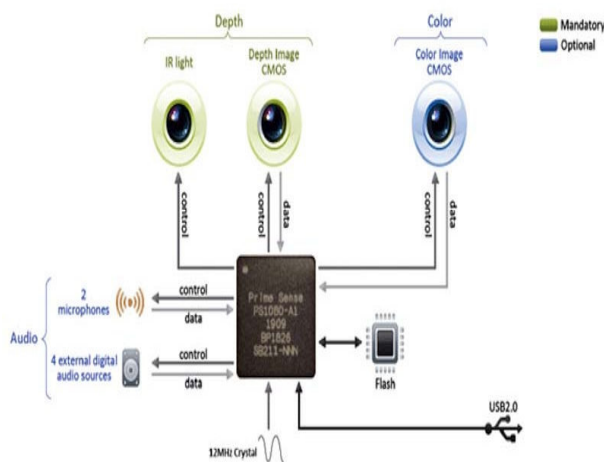


Fig. 2: Gesture Recognition Camera.



The method of recognizing gestures as input to various devices allows computers to be more accessible for the physically-impaired persons and makes their interaction more natural.

GESTURE TYPES:

In this gesture recognition based computer interfaces, two types of gestures are known: First is online gestures, which can also be observed as direct manipulations like scaling and rotating[6]. In contrast, second offline gestures are usually checked after the interaction is finished.

VARIOUS TYPE OF GESTURE RECOGNITION FUNCTIONING:

Gesture recognition is very special kind of measure to process information which is not conveyed through speech or type.

As a matter of fact, there are various types of gestures which can be used in computing as passwords.

Sign language recognition

As there are various types of speech recognition software, which can decode speech to text. In the same way, certain types of gesture recognition software can decode the symbols represented through sign language into text as well.

Robotics

By making use of proper sensors put on the body of a person and by recording the values from the same sensors.

Direction indication through pointing

The use of gesture recognition to verify where a person is pointing is particularly useful.



Control through facial gestures

Eye tracking may be handy for controlling cursor motion on elements of a display device.

Controlling the computer operations through facial gestures is a very useful application of gesture based recognition for users who may not physically be able to use a mouse or keyboard by their own.

Game Technology

Gesture technology can be used to control interactions with digital video games to make the game player's experience more reality.

Virtual controllers

These systems can be used for systems where acquiring a physical controller could require too much time or with some difficulty, gestures can be used as an alternative control mechanism to perform the same job.

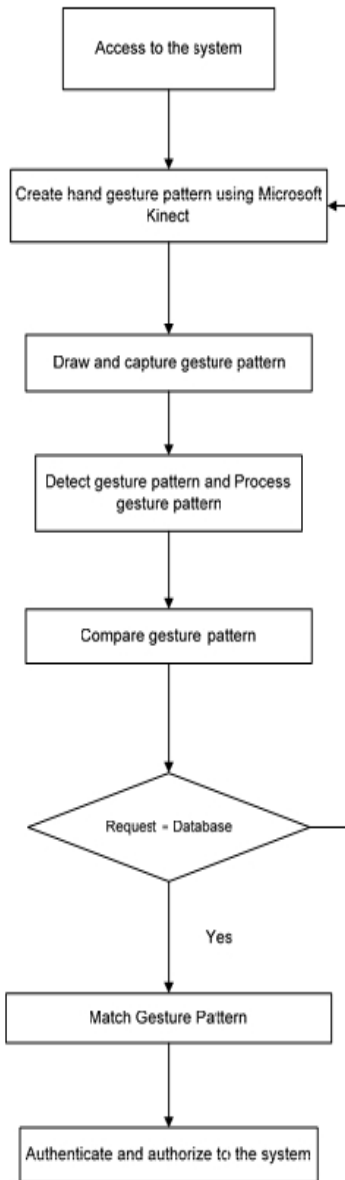


Fig. 3: System Flow

CONCLUSION & FUTURE WORK



Mobile banking is a new system for customers to perform transactions, and is predicted to increase more rapidly in future also. For the last decade, banking has taken a new form, banking at customer's own location. Mobile banking has come into view as a powerful provider of bunch of banking services. The worldwide adoption of mobile banking will depend on the secure, reliable and effortless user interfaces. Since the beginning of remote banking, username and password are most widely used techniques for log in to an banking account.

But the major limitation of this method is that, passwords can often be stolen, accidentally revealed, or forgotten by the user. Gesture based password recognition provide secured alternative for the traditional password approach. This mechanism is excellent to protect from brute force attack, all types of man in the middle attack, dictionary attack, various types of key-logger etc.

A lot of work has to be done in this gesture based approach, as this method can produce results as a part of some other authentication method and cannot produce good results at its own.

REFERENCES

- [1] Ali Shahrokni, Tom Drummond, François Fleuret, Pascal Fua, 2009. "Classification-Based Probabilistic Modeling of Texture Transition for Fast Line Search Tracking and Delineation", IEEE Transactions on Pattern Analysis and Machine Intelligence, 31(3): 570-576, DOI: 10.1109/TPAMI.2008.236.
- [2] Huazhong Ning, Tony X. Han, Dirk B. Walther, Ming Liu, Thomas S. Huang, 2009. "Hierarchical SpaceTime Model Enabling Efficient Search for Human Actions", IEEE Transactions on Circuits and Systems for Video Technology, 19(6): 808-820, DOI: 10.1109/TCSVT.2009.2017399.
- [3] Jesús Martínez del Rincón, Dimitrios Makris, Carlos Orrite Uruñuela, Member and Jean-Christophe Nebel, 2011. "Tracking human position and lower body parts using Kalman and particle filters constrained by human biomechanics", IEEE Transactions on Systems, Man, and Cybernetics Part B: Cybernetics, 41(1): 26-37, DOI: 10.1109/TSMCB.2010.2044041.



[4] Leonid Raskin, Michael Rudzsky, Ehud Rivlin, 2011. “Dimensionality reduction using a Gaussian Process Annealed Particle Filter for tracking and classification of articulated body motions”, *Computer Vision and Image Understanding*, 115(4): 503-519, DOI: 10.1016/j.cviu.2010.12.002.

[5] Michael H. Lin, Carlo Tomasi, 2004. “Surfaces with occlusions from layered stereo”, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 26(8): 1073-1078, DOI: 10.1109/TPAMI.2004.54.

[6] Olivier Bernier, Pascal Cheung-Mon-Chan, Arnaud Bouguet, 2009. “Fast nonparametric belief propagation for real-time stereo articulated body tracking”, *Computer Vision and Image Understanding*, 113(1): 29-47, January 2009, DOI: 10.1016/j.cviu.2008.07.001.