WEBSITES USING TOUCHLESS INTERACTION HAVING GRAPHICAL PASSWORD AUTHENTICATION AND EMBEDDED ANDROID APPLICATION

Wafa Waheeda S[1], M. Shunmugapriya[2], K. Dheephikaa[3], J. Visumathi[4]

[1]*Department of CSE, Jeppiaar Engineering College, Chennai, India*
[2]*Department of CSE, Jeppiaar Engineering College, Chennai, India*
[3]*Department of CSE, Jeppiaar Engineering College, Chennai, India*
[4]*Department of CSE, Jeppiaar Engineering College, Chennai, India*

Abstract
Living in an era of touch screens and large monitor screens, basic interactions on them have gone uncomfortable and difficult to understand. To overcome this difficulty, we discovered that, operating a device with the help of gestures via touch less interaction. To apply the idea of touch less interaction on a website, web camera facility is required, as the website takes the navigation instructions from a web camera. Henceforth a device which is connected to the internet uses the JavaScript and web camera gestures to enable having a website to navigate through the large monitor screens and also to be easily operated. In this busy world, where users keep forgetting account passwords, this website also allows them to generate graphical passwords for authentication. This will make user accounts sound safer and passwords remember able. In this paper we have developed a website using touch less interaction and also this website has an embedded android application running on it.

Keywords: Touch less interaction, Gesture based navigation, Graphical password, Embedded Android application;

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1. INTRODUCTION

Independent navigation is becoming a bigger challenge with the advances in technology and increasing size of monitor screens. As with growing technology, the digital displays keep on growing in size and they have also found their way into homes, offices and public spaces, more and more. However, in many cases these displays are not yet interactive and they merely present information. An untapped potential is the interactivity of these large displays for which there are diverse application areas: meeting rooms, surgery rooms and shopping centers. And these digital devices will always be connected to the internet. Providing a website, which will be operated based on Gesture based navigation via touch less interaction, will solve the problem faced on large digital screens. Examples include the interactions for navigating e-shopping website or any other website, which can be navigated via touch less interaction on any large sized digital display screens.

For the touch less interface to be successful, it is of paramount importance to understand the interactions that take place with it. It was recently shown that touch-sensitive displays can be built cheaply and with ease and, as a result, there has been extensive attention for the interactions with touch-sensitive displays. However, interactions with large displays cannot always be based only on tactile input. Displays might be placed out of reach or behind glass surfaces to prevent

vandalism, other users might obstruct the interaction or the display might be too large.

The digital display surface or monitor screens may not be touched in touch less, gesture-based interactions. These interactions are a direct extension of touch-based interactions and, as a result, they can and should complement one another. But what makes hand gestures are suited for these touch less interactions is that the choice for gestures in commercial systems and scientific prototypes is driven by technological developments and by the cost, complexity and availability of the sensors that are used to look at the users gesturing. This often entails that seemingly unnatural gestures must be learned by users to accommodate the sensor, for example, using the flat hand in various poses to navigate a menu of website. This contradicts other claims that the interaction should come naturally. However, the extent in which these gestures are really intuitive is mostly ignored; 'intuitive' meaning how easy users can learn, remember and correctly perform these gestures.

Touch less, gesture-based interactions with large displays are best based on intuitive, everyday actions. And providing a graphical password to the touch less website user is becoming of prime importance, because of the busy life. A graphical password system is to provide an authentication system that works by having the user to select from images, in a specific

order which are presented in a graphical user interface (GUI). Also the most commonly used computer authentication methods, is to use alphanumerical usernames and passwords. But using alphanumeric usernames and passwords have shown drawbacks in terms of security. For example, the user tends to choose a password that can be easily remember able and guessed. On the other hand, it gets hard for the user to guess a password which is often hard to remember and guess.

Authentication is the process to allow users to confirm his or her identity to a Web application. The weakest link in a computer security system, where often considered to be human factors.

There are three major areas where human-computer interaction is considered very important. They are, 1. Authentication 2. Developing Secure Systems and 3. Secure Operations. And here we focus on the user authentication problem. We know that a a secret form of authentication to data is via a password. The password is known only to the user or in other words. It is kept secret from the unauthorized to prevent their access. And those users who wish to gain access are tested whether they know the password or not and based on that, they are granted or denied access accordingly. And the use of password in ancient times, would allow the person knowing the password. But now a days, in modern times, the passwords control access to a protected computer operating system, ATMs machines, Bank accounts, Mobile phones etc. Generally, a typical computer user will require passwords for a lot of purposes like, logging in to the computer system's account, accessing the private files, email accounts, databases, networks, bank accounts and web sites. As most of the things happen online now a days, everything gets stored in a computer by a user from reading newspaper to accessing their highly confidential bank accounts.

Passwords are even now a very good and strong authentication method used up to now. But the huge advance in the uses of computer in many applications, such as sharing of data, data transfer, login to emails or internet are some of the drawbacks of conventional password, which appears like the stolen password or even forgetting the password and week password. And so there is a big necessity for the users to have a strong authentication way which is needed to secure their applications. And thus, to avoid the weakness and drawbacks of conventional password, we go for the graphical password authentication methods.

The graphical password authentication system is proposed as a possible alternative to the text based password authentication. And is proposed by the fact that all humans cannot remember text as well as they remember pictures better. Especially photos, a form of pictures representing moments, can be easily remembered than random pictures.

And this website has an embedded android application, which makes it multi-operational. Here, the user is allowed to access the website via touch less interaction and also create graphical password authentication. Having an android application, which enables the user to run the application, makes the website more interactive and productive.

In further sections, we discuss more about the touch less interaction, gesture based navigation, the graphical password authentication and the embedded android application. On whole, the era of touch less technology and touch less websites is being discussed.

2. LITERATURE SURVEY

[1] David Lowe, Xiaoying Kong "NavOptim Coding: Supporting Website Navigation Optimisation using Effort Minimisation") put forth the idea of the importance of web applications and also highlighted the problems faced during the web navigation. Also proposed the navigation optimization techniques for it. [2] Wim Fikkert Paul van der Vet Anton Nijholt "User-evaluated Gestures for Touchless Interactions from a Distance" highlighted more on the touchless interactions with a device using a gesture based navigation technique. But the proposed system is where a tocuhless interaction will enable navigation in a website on large displays via gesture based navigation. This website will also have a graphical password authentication facility and an embedded android application features in it. Also, [3] Yuxin Meng "Designing Click-Draw Based Graphical Password Scheme for Better Authentication" and [4] Srinath Akula, Veerabhadram Devisetty's "Image Based Registration and Authentication System" elaborated more on the authentication of user via images. [5]Yonghong Wu, Jianchao Luo, Lei Luo "Porting mobile web application engine to the Android platform" explain the graphical passwords and porting android on web platform in a elaborated manner on different systems. But in this proposed system, they will be deployed on a website accesses via touchless interaction using gesture based navigation facility. [6]Don Norman & Bahar Wadia "The Next Touch Evolution. Advancing the Consumer Experience in Other Realms: Tasks and Tough Environments" highlighted the opportunities and challenges for touch and gesture based systems, which are overcome in this proposed system. [7]"Design and development of an Android application to process and display summarized corporate data" explained the concept of databases in android apps, and the data storage, access in them.

3. LINEAMENT OF SYSTEM

This system is provided as a solution to the navigation facility offered by it on large monitor screens. Those digital displays, which are huge, are navigated via touch less interaction based on gestures. The devices have a web camera attached to them, with the help of which navigation through the website takes place.

3.1. Touch less Interaction by Gesture Based Navigation

For touch less interaction to take place in a system on a device, there exists a sensing space for the gestures to be taken as input for navigating through the website. The sensing space will detect the gestures which help in navigating through the website via touch less interaction. The space between the web camera and the gestures given by the user, on a device, is sensing space.
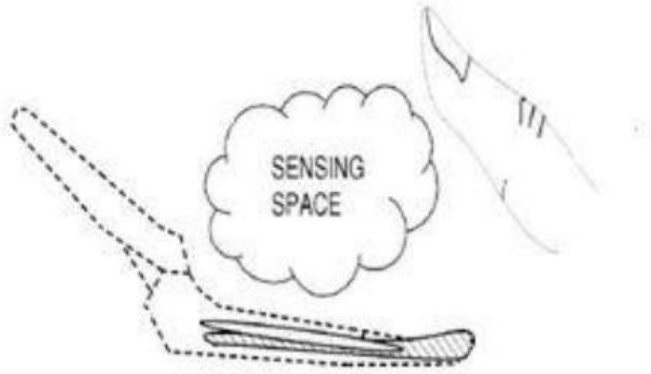

Fig -1: Device's sensing space–gesture detection in website navigation

This figure displays the sensing space of a device. Generally, in most of the devices, the web camera is attached on top. And the web navigation facility is obtained by waving the hand (making a gesture) in front of the web camera attached to the large digital display device.

Fig -2: Website navigation through gesture based touch less interaction

The website having touch less gesture based navigation is used to navigate the menu of the website using the web camera. For the website to use the web camera facility, the java script plug

in will be invoked by it. And the user will be allowed to view the option dialog box, to enable the java plug in and navigate the website using the web camera of device. This device will also enable the user to have a login access. And authenticate the user using graphical password authentication scheme.

3.2. Graphical Password Authentication

A graphical password scheme is to enable the user remember passwords easily. The graphical password can be in variety of forms. It is by clicking on the sequence of graphical images, and recording the sequence and image as password for user authentication. Generally authentication is of many forms and the graphical password authentication comes under the knowledge based authentication method. And in turn, the knowledge based authentication has two forms, i.e., text based passwords and picture based passwords.

The picture-based techniques which come under the graphical password authentication technique, is divided into two categories, 1. Recognition-based graphical technique and 2. Recall-based graphical techniques. Here, using the recognition-based techniques of picture, the user will be presented with a set of images. And the user will pass the authentication by recognizing and identifying the images that he/she has selected during the registration stage of creating an account for user authentication. Whereas in using the recall-based techniques, a user is asked to reproduce something that he/she has created or selected earlier, during the registration stage.

Here, in the recognition based technique, the registered pictures are present and displayed as themes, which a user is allowed to select one as theme for password.
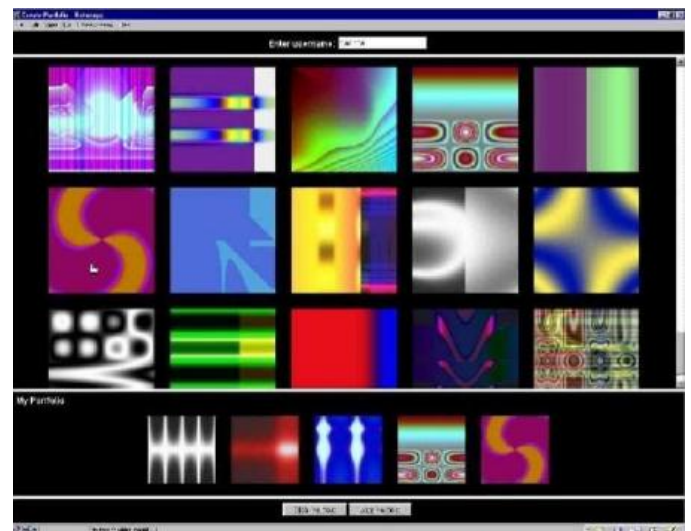

Fig -3: Selecting theme for graphical password authentication

When the authentication process is carried, the user must enter the registered images in a correct sequence, as entered in the registration process of account creation. But there is a drawback of this technique. And that is the number of thumb nail images being limited to a number, which corresponds to the small password space. And here, each thumbnail image will be assigned a numerical value. Also, the sequence of selection will generate a numerical password, by which the user will be authenticated. The result will show the image sequence length which was generally shorter than the textural password length. And in turn to address this problem, the idea of combining two pictures to compose a new alphabetical element. Thereby expanding the image alphabet size and having a long secured graphical password to authenticate the user safely.

3.3. Embedding Android Application

Embedded android application in the website is the other last feature of it, which helps user run the application and perform the task. Since there are many drawbacks faced by an android application on having database connectivity, running the app on the website will help provide better MySQL connectivity and also test and run the application to perform the application operation.
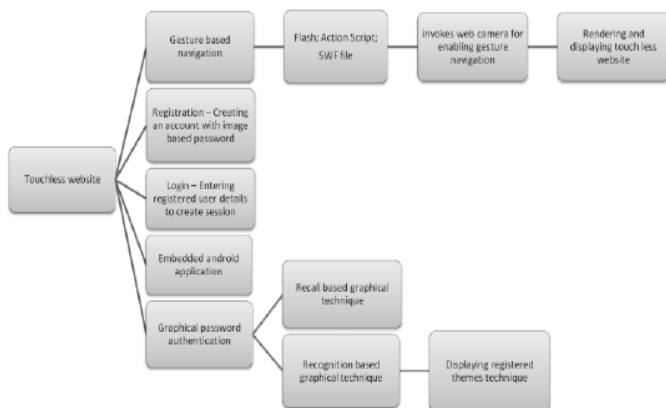
4. SYSTEM ARCHITECHTURE

Fig -4: Architecture of proposed touch less website

The architecture of proposed touch less website system is as shown above. The entire website consists of three built in modules which are the touch less interaction using gesture based navigation, graphical password authentication to the user and embedded android application in the website. In the gesture based navigation module, the JS of the website will invoke and enable the web camera, by asking the user whether he wants to enable or skip and use the default method. And once the web camera is enabled, the user will be allowed to navigate through the website via gestures displayed in front of the web camera.

Here, the graphical password authentication is used to enable the user to create a authenticated account in the website. Thereby enabling security to the user accounts via graphical password authentication. The graphical passwords are of many types, of which the recognition based technique is implemented in the website.

The embedded android application in the website will enable the user to run the android application and perform the basic functionality of the android app embedded in the website. This happens by embedding the .apk file of the android application inside the webpage of the website.

5. IMPLEMENTATION OF THE PROPOSED SYSTEM

Working of Proposed System is split into modules for easy explanation.

5.1. Touch less Interaction

Our proposed system will comprise of the touchless website, navigating with the help of gesture based navigation. It comprises of 5 steps, which will enable the user to navigate via gestures given by the user through a web camera.

Step 1
A touchless website's URL is entered by the user where a digital device having internet and web camera facility is navigated using a touchless website by user, giving gestures for navigation

Step 2
JavaScript will be invoked and will ask for users permission to access the web camera

Step 3
The web camera gets on, and the user is now allowed to make gestures in front of the web camera

Step 4
The gestures given by user in front of web camera is identified and taken as the navigation request by the user to the website with the help of the JavaScript

Step 5
The user is allowed to navigate via gesture based navigation facility of the website, hence supporting easy navigation.

5.2. Graphical Password Authentication

Here, our proposed graphical password authentication system, will comprise of 6 steps. Out of which steps 1-3 are registration steps to enable the user register for a graphical password authenticated account. And steps 4-6 are for

authentication, which will enable the user to authenticate safely with the graphical password facility.

Step 1
The first step is for the user to register and to type the username and a textual password, which will be stored in the database.

Step 2
In this second step objects in the form of pictures will be displayed to the user and he/she selects minimum of three objects or spots on a picture, from the set displayed. The selected spots on the picture will be again stored in the database with the specific appropriate username.

Step 3
And during the authentication, user selects the registered picture, and clicks on the spots as his password on a touch sensitive screen (or according to the environment) with a mouse.

Step 4
The system performs pre-processing where a numerical calculation will be performed by the system, taking in consideration of the numerical value of the spots on picture and the sequence

Step 5
In this step, the system compares the numerical value of that in the database

Step 6
After crosschecking, the system considers the user to be authenticated and logs in the user successfully

5.3. Embedded Android Application

And finally the last module of our proposed system will consist of an android application inside the website, suitable database connectivity. The working of the android application will comprise of the following steps.

Step 1
The user, after logging in the website, will be directed to the embedded android application. Where, the apk file of android app, embedded inside the website, allows the user to operate the app.

Step 2
User enters values, and interacts with the android application.

Step 3
Entered input values get stored in the database.

Step 4
The application functions and processes the output on the android application of the web page.

6. PROPOSED SYSTEM OUTPUT

6.1. Touch less Interaction on the Website

The enabled JavaScript will display a message to the user, to allow the web camera access of the system. And when the web camera is enabled, the user navigates, by making gestures in front of the web camera.

Fig -5: Touch less Website displaying JavaScript Message to User

6.2. Graphical Password Authentication

During registration, the user is allowed to select a graphical password for account. Registered images displayed as themes, from which the user is allowed to select one, and create a password by clicking on each part of the image chosen.

Fig -6: Login Interface

Fig -7: Choosing Password

6.3. Embedded Android Application

After logging into an account, user can run application and perform task. This application creates connectivity to MySQL database and performs the application.
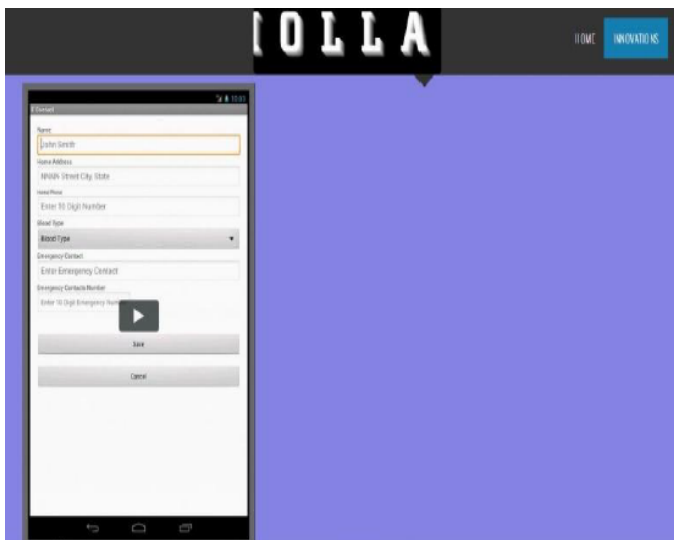

Fig -8: Embedded Android Application in the Website

7. CONCLUSIONS

In this paper, we have proposed touch less website with three built in modules enabled in it. With the features of gesture based navigation in front of a web camera, graphical password authentication and an android application embedded in the website, the website proves to be multipurpose. And is also efficient compared to the drawbacks, which were overcome in this proposed system.

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BIOGRAPHIES

Wafa Waheeda S is an undergraduate in Computer Science and Engineering in Jeppiaar Engineering College, Anna University. She has special interest in website and application development. She is a Richard E Merwin Scholar in 2013. She has taken over various responsibilities in IEEE, IEEE WIE, IEEE Computer Society, and Computer Society of India. She is placed at Wipro pvt ltd and is starting her career this year. She has good social concern and involves herself in activities encouraging women and students with high interest.

M. Shunmugapriya is an undergraduate student of Computer Science and Engineering in Jeppiaar Engineering College, Anna University.

K. Dheephikaa is an undergraduate student of Computer Science and Engineering in Jeppiaar Engineering College, Anna University.