

# Security Toolbox for Authentication, Character Recognition and Language Coder

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**Abstract.** Today Authentication still suffers from numerous fallacies that an attacker can take advantage of. These include click based screenshot, over the shoulder spoofing and co-ordinate position noting.

To overcome these drawbacks, we have designed a security toolbox which contains options for a dynamic virtual keyboard, a track pad and language convertor. The toolbox will have a drag-n-drop feature so that the user can select which ever option they want to use. The Dynamic Virtual Keyboard will have Dynamic Keyboard Layout Generation, Hidden keys to prevent screenshot capturing and shuffled keyboard after every click. The user can also select the option ‘Track pad’ through which character recognition and authentication of password can be done. The Third option will be ‘Language Coder’ wherein the keyboard will be displayed in any other language with the backend mapping to English characters..

This project intends to mimic the possible ways in which secure authentication, Character recognition and Language Translation can be achieved. Though using this technique the time taken to type password is slightly more than the traditional authentication mechanism, but user is protected against all kinds of attacks on his/her credentials.

## 1. Introduction

One of the biggest problems facing our Internet business today is the major issue of trust and security. The vast majority of consumers are concerned about the safety of their credit card and personal details. People simply don't trust the Web, fearing that their transactions might not be safe. Not only are consumers concerned, the prospect of online credit card fraud also has an adverse effect on potential online shoppers. Also, our email accounts, social networking sites are not safe enough. Nowadays, the authentication procedures available don't provide complete security to our usernames and password. They can be hacked through key loggers, spoofing etc. Thus there is need for secure authentication is known by the valid users only. And these mappings can be changed by the users.

## 2. Overview

### 2.1. Dynamic Virtual keyboard

Here we are proposing a dynamic virtual keyboard with following features:

- Dynamic Keyboard Layout Generation
- Hidden keys to prevent screenshot capturing
- Shuffled keyboard after every click
- A sample dynamic virtual keyboard of our proposed concept is shown below.

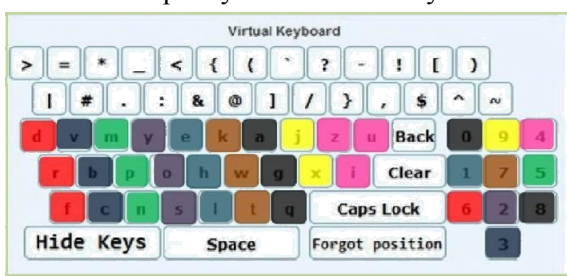


Fig. 1: DYNAMIC VIRTUAL KEYBOARD

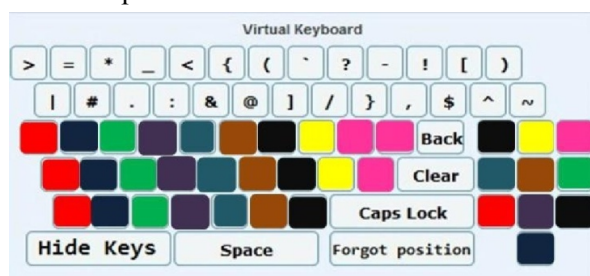


Fig. 2: DYNAMIC VIRTUAL KEYBOARD AFTER PRESSING “HIDE KEYS” BUTTON

Let us assume that the password of the user is “xyz”. Here the user is allowed to enter one character at a time. Initially the user should note the position of character he wishes to enter. It is ‘x’ in our case. We have made colour coding so that it is easier to remember. In this case we see that ‘x’ is in yellow color and second from top. After that the user has to click hide keys button. This button converts the translucent colour into opaque colours of the same shade as shown below in Figure. Now user can click the yellow button, second from top to type

‘x’. After the user clicks ‘x’, the layout of the keyboard changes again and the procedure is repeated once more. In case the user forgets the position of the character after clicking hide keys, he can click the button forgot position. This would result in the same keyboard layout generation as before.

## 2.2. Track pads for login and character recognition

Character recognition software allows for an intuitive way to capture a visually LCD based interactive signature capture that easily recognizes the characters. With increasing emphasis on legal paperless transactions, this software is ideal for capturing legal electronic signatures (per ESIGN and UETA) in any customer facing situation in insurance, banking, government, medical and retail point of sale applications, and ID cards accurate signature and display other ceremonial information (name, time, date, intent, etc.) and bind this information to the document or Transaction. This software runs on algorithm. When the character is drawn, the character recognition algorithm is run behind and the letter is recognized. The keyboard is not required here. The Character is drawn here with the help of the mouse which is used as a pen input. The software is run to recognize the character one by one. Once all the characters are recognized correct, which will be the crucial information of the user, the verification is done.

## 2.3. Language Coder keyboard

A language coder is in essence an expert who performs the function of mapping between different language to English characters. Each and every letter of displayed other language keyboard when clicked shows English letters on the screen. This screen can be hidden while the actual login process is going on. Thus any hacker would not come to know what the user has clicked. A normal virtual keyboard would be used but its internal working would be changed depending on the language selected by the users. All the characters in the Hindi keyboard will be mapped to the English characters which is authorized only to the user. These mappings are not necessarily with same characters in English and Hindi.



Fig. 3: NORMAL VIRTUAL KEYBOARD

## 2.4. Features

The proposed approach provides protection against key loggers, over the shoulder spoofing, screen capturing after click event. The track pad supports character-recognition, signature-capture, and character recognition software when used as a pen input, and thus provides authentication without any need of keyboard. This way secure authentication can be obtained. Other than authentication, track pad will be utilized for signing as well as character recognition. Language translation wherein whatever the valid user will enter in the existing virtual keyboard will be displayed in any other language

## 2.5. Limitations

Time taken for typing the password will be slightly more than the traditional virtual keyboard. For language translation only few languages would be considered. The accuracy of track pad pointing may not be as good as it would be with a mouse or trackball.

## 2.6. Conclusions

In this paper we have shown the possible ways in which the current implementation of virtual keyboard is vulnerable to attacks. We have proposed a dynamic virtual keyboard layout for the same. We have shown that our implementation does not suffer from the drawbacks suffered by current implementation of virtual keyboard. Though using this technique the time taken to type the password is slightly more than traditional virtual keyboard, but user is protected against all kinds of attacks on his / her credentials. Also all the implementation were done using existing technology

## 3. References

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