

RESEARCH ARTICLE



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## A REAL SENSE BASED MULTILEVEL SECURITY IN CLOUD FRAMEWORK USING FACE RECOGNITION AND IMAGE PROCESSING

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### ABSTRACT

Nowadays keeping data secure is very big issue. In the world of technology we use various types of social media in day to day life. In this we use to share our daily updates, various type of information which is store in database(at cloud) and many times due to lack of security this data can be handle by intruder(hackers) which can be misused. To provide higher security to data stored in cloud our system provides 3 levels of security using inlet real sense 3Dcamera (SR300). Each level of the system is different than each other so it provides more security. In this system first level is username and password through OTP. Then second level is hand gesture in which user have to make pattern which is second password. Then final level is face recognition which detect landmark points and stored as third password.

KEYWORDS: 3D Gesture, Real Sense, Image Processing, Face Recognition, and Cloud.

### INTRODUCTION

Nowadays Cloud Computing is enormously used by individuals and organizations for storing and accessing data rather than using the computer's hard disk or any physical device[2].

However, without adequate protection or security, many individuals, businesses, and governments are at risk of losing the assets. Important data may be tampered or hacked. The goals of cloud security are to protect confidentiality, maintain integrity, prevent data tampering and assure availability.

The third-party administrative control is done in cloud computing which gives rise to security concerns the attacks may happens by data of other users and nodes within the cloud hence, high security measures are required to protect data within the cloud. Until now various traditional methods are used to secure the information which mainly contain methods like graphical password,

captcha, username and password. In this paper we propose 3Way security in cloud using real sense 3D(SR300) camera that will collectively approaches the security and performance issues. Here we provide three steps for authentication of the user

- 1) Text password
- 2) Hand gesture recognition.
- 3) Face recognition.

In existing system we are providing security to data stored in cloud. As we know we use many social platforms to connect with world. It include many social platform like LinkenID, Facebook, Twitter, Instagram, Gmail etc... its very tedious to remember different passwords. Many times due to many reasons like data loss, human errors, lack of data integrity[3] intruder can access our data. To avoid all this chances we provide multilevel security so that it is difficult for intruder to access our data.

In this we introduce three levels of security as below:-

1) Text password:-in this user have to enter text password. Then with the help of hashing table (algorithm) and then stored at server database.

2) Hand gesture recognition:-in this user have to place hand in front of camera

so camera detect it ,select one point out of 22 points on the hand whatever pattern user make in front of camera is saved as password in server database.

3)Face recognition:-in this user have to place face in front of camera.so camera detect the face and select some landmark points out of 78 landmark points. Then the features are saved as password in server database.

**DEVELOPED SYSTEM**

As shown in given figure software application is used with the combination of Intel real sense camera with the help of this we develop a system in which user do not need to remember many password. In this system firstly user have to do registration in which user have to enter some basic information like username and password of choice ,full name and email-id.

Then user have to make pattern [6]of his/her choice in front of camera then face recognition is done(78 landmark points are recognize and distance between adjacent points are calculated with the help of distance measure algorithm.).

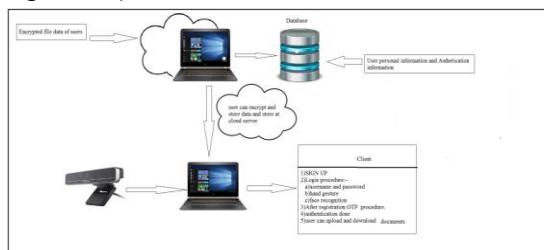


Fig 1. System Architecture

After all these steps registration is done .when next time user enter username and password again hand gesture and face recognition is done .after this when we proceed then OTP is generated and then user have to enter the OTP which is received on email-id. After entering OTP if it is correct then user can now access the data on cloud

i.e. uploading and downloading of the files/documents which is stored in encrypted form. For encryption purpose we are using AES algorithm. when we enter username and password then this is hashed with the help of SHA-3 algorithm.

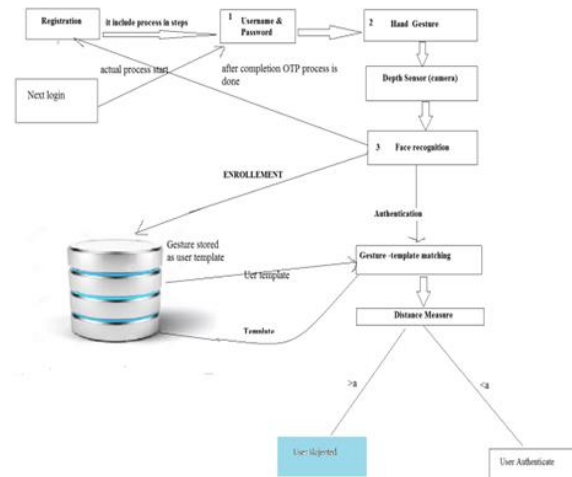


Fig 2. Conceptual architecture

For storing the data we are not using any database because it is difficult to maintain the real time data.so we are using serialization concept. The Actual process of whole system is as shown in the figure below. When we input the hand gesture for the first time, it is stored as a user template and for the further times the gesture is compared with that template for matching. If the template is matched after getting the distance and other details of the gesture, user is authenticated else user is rejected.

**ANALYSIS**

**OLD SYSTEM:** As nowadays penetration of internet in our daily life increases so present security system is not enough to provide strong security to our personal data.Currently, security in information technology is considered as an important aspect. Hackers or the number of attacker’s are increased in order to address important data on the new technologies. Out of these technologies cloud computing is adopted by many companies due to industrial and commercial profits of cloud but the main concern of these companies is how to provide security to their data.

**NEW SYSTEM:** In the developed system multilevel authentication is introduce which is combination of software and hardware. Suppose we are working in large institute then we have to store huge information in database some information is very

important like clients credentials, market analysis, business information which cannot be leak at any cost. If company loses this kind of data then it may cause big harm to the company .so to avoid data loss few people have given the rights to access that data. For this access also proper authentication is required so we use multilevel authentication [1] to cloud where companies store their data. In this system at client side real sense camera is attached .In this first level is registration in which user have to enter username and password of his own, then full name, email-id then pattern made by hand gesture and face landmark points. after all these procedure OTP is generated which will received on email-id. After verification of OTP client is registered for the system. All this information is stored at server database as historical database.

In next step when user login for next time user have to put username and password then again user have to make the pattern which is made at the time of registration and face landmark points are also stored in the database. After entering username and password both are hashed with the help of SHA algorithm[5].This hand pattern is recorded as x,y plane as on screen and Z-axis is considered as depth of camera i.e. distance of our hand from camera. Then threshold values of present

and historical pattern is matched if it comes around 80-90% then pattern is matched.

At the time of face recognition 78 landmark points [6]are detected by the camera then distance between two adjacent points are stored which is calculated by distance measure algorithm. then it is stored in database as third password. All these passwords are stored in encrypted form with the help of AES algorithm[5].

After all these steps OTP verification is done .then user is now authenticate user so that user can now upload or download the files from cloud server. In this system if intruder get username and password anyhow then also he cannot access the data as pattern made by the user is unique .Everyone have different face structure so landmarks points distance is varies from person to person. Due to this distance between landmarks is also different so it is difficult for intruder to act like user. If intruder try to bring photo of user in front of camera then also camera will not match it as in photos pixels are spread and as camera take real time input it will not matched.

In this way it is very difficult for intruder to break the security of the system which provide high level of security to the system.

**TEST CASES:** There are various approaches for testing purpose. Here we are using unit testing

Test case	Test case objective	Expected result	Actual result	Status (pass/fail)
TC-001	Leave all fields as blank and click Log-in button	By leaving all fields as blank and on click Log-in button then mandatory symbol ( * ) should appear in front of Username and Password fields	*Symbol is appeared	PASS
TC-002	Enter Invalid Username	By entering invalid Username then an error message should appear as " Please Enter Valid Username "	Please Enter Valid Username occur	PASS
TC-003	Enter valid Username	It should allow the user to proceed	Proceed occurred	PASS
TC-004	Enter password	The password field should display the	Show encrypted format	PASS

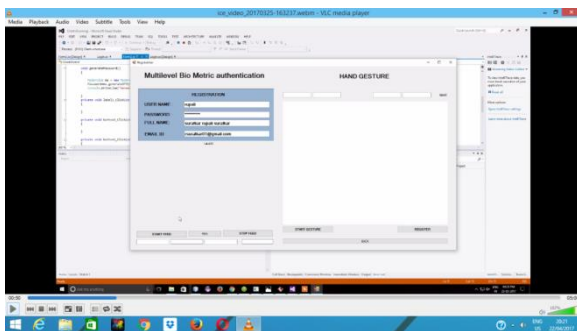
		encrypted format of the text typed as (****)		
TC-005	Enter wrong password	By entering invalid password then an error message should appear as " Please Enter Correct Password "	Please enter correct password on screen Occurred on screen.	PASS
TC-006	Enter Correct password	It should allow the user to proceed	Allow to proceed	PASS
TC-007	Correct Inputs	It should lead the user to the respective page	Correct input is given	PASS

GUI and Usability Test Scenarios	Test case objective	Expected result	Actual result	Status (pass/fail)
TC-001	Check for Validation / Error Messages on all the Screen	Validation error messages Shall be displayed properly at correct position	Error displayed	PASS
TC-002	Check for all the Fields Label on all Forms	Field labels Shall be standard e.g. field accepting user's first name should be labeled properly as 'First Name'	Proper labels are occurred	PASS
TC-003	Check text on all pages for spelling and grammatical errors	All Spelling Shall be Correct and without Grammatical Errors	All spellings are correct	PASS
TC-004	Check functionality of buttons available on all pages	All Buttons on the Forms should be Functional	All buttons are functional	PASS
TC-005	Check all the Fields on the Page/ Forms	All fields on page (e.g. text box, radio options, dropdown lists) shall be aligned properly	Aligned properly	PASS
TC-006	Check the space between Fields on all Forms / Pages	Enough space shall be provided between field labels, columns, rows, error messages etc.	Enough space is provided	PASS

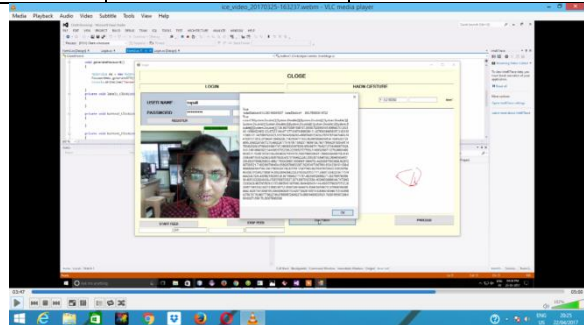
Database Testing Test Scenarios	Test case objective	Expected result	Actual result	Status (pass/fail)
TC-001	Check if correct data is getting saved in database upon successful page submit	Correct data shall be saved in database	Correct database saved	PASS
TC-002	Check values for columns which are not accepting null values	Enter Null/ Empty Values into database	Null values entered	PASS
TC-003	Check for data integrity.	Data shall be stored in single or multiple tables based on design	Data stored in table as per the design	PASS
TC-004	Check for Primary Key	Tables shall have primary key column		PASS
TC-005	Check if data is committed to database only when the operation is successfully completed	Data shall not be committed to database before committing		PASS
TC-006	Check the Database name	Database name shall be given as per the application type i.e. test, UAT, sandbox, live (though this is not a standard it is helpful for database maintenance)		PASS
TC-007	Check if database fields are designed with correct data type and data length	All the fields shall have correct data type and size		PASS
TC-008	Check if all table constraints like Primary key, Foreign key etc. are implemented correctly	All tables constraints shall be implemented correctly		PASS

Performance Testing Test Scenarios	Test case objective	Expected result	Actual result	Status (pass/fail)
TC-001	Check if page load time is within acceptable range	Page shall be loaded within acceptable time range		PASS
TC-002	Check page load on slow connections	Page shall be loaded within acceptable time range		PASS
TC-003	Check response time for any action under light, normal, moderate and heavy load conditions	Page shall be loaded within acceptable time range		PASS
TC-004	Check database query execution time	Database query execution time shall be within acceptable time range		PASS
TC-005	Check CPU and memory usage under peak load condition			PASS

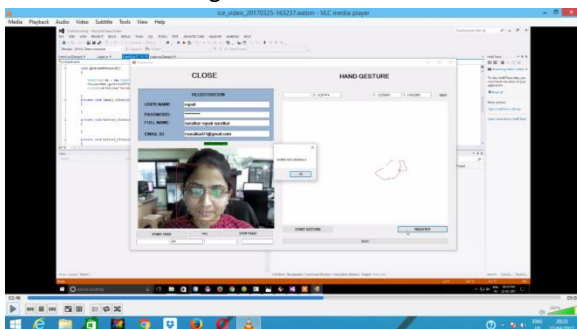
**RESULT**



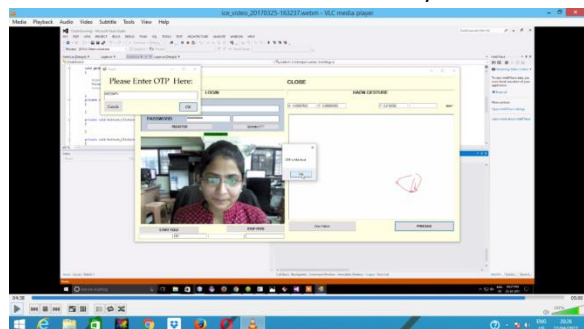
Registration Process



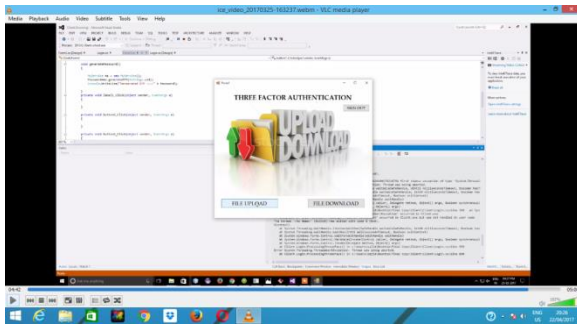
Detected points got matched with stored database, OTP matched successfully



Landmark points on face and hand are detected



OTP matched successfully



Now user can upload and download files

### CONCLUSION

In this system we use real time input i.e. hand pattern, face recognition which is not copied by any intruder. These systems overcome the drawbacks of the traditional computer based security systems which are used at the places like ATM, passport, payroll, drivers' licenses, credit cards, access control, smart cards, PIN, government offices and network security. These can be done for the processing only in the presence of a person. Hence these systems are proved highly confidential computer based security systems. This system recovers the drawbacks of previous systems by means of the newly developed stages for securing of the data.

### FUTURE ENHANCEMENT

For more security purpose we can use retina scan, voice input, palm detection[4] etc...which can also provide better security than the existing system. As nowadays real sense camera is inbuilt in laptops and in future it will come in mobiles so we can develop android app also which is easy for user to carry at any place instead of desktop version.

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