

Implementation on Integration of Biometric Technique to Security in Cloud Computing

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Abstract

In this research paper we have integrated Biometric based security to the cloud computing system. Here the objective is to make the remote resources on cloud server security by introducing biometric based security. In order to enhance the security of data on remote cloud in this paper the study of existing threats to cloud server security has been discussed. The existing systems along with their limitation are also considered. The clouds are usually hosting files and commercial websites so the security of cloud is demand of the day. Here the integration of physical trait based biometric technique is made with cloud computing.

Keywords: Cloud Computing, Biometric, Security, Hacker, Detection

I. INTRODUCTION

The need of cloud is increasing day by day. Everybody who uses web services is aware from cloud services. They usually take benefit of remote storage as well as remote services from cloud based systems. The systems are beneficial for users as they need not install the original application on their own computer. They access application remotely from cloud servers. They also store their sensitive information on remote clouds. So the security of such remote cloud is must from hackers. Today mobile, laptops, tablets and personal computers are connected to cloud servers.



Figure 1: Cloud Computing

Biometrics Security in Cloud Computing

The biometric based security has been divided on the bases of physiological and behavioural characteristics. The physiological characteristics consists of face, DNA, iris and finger recognition based biometric systems. But the behavioural characteristics involve keystroke, voice and signatures. The theme of this paper is to introduce the concept of security in cloud computer with biometric techniques.

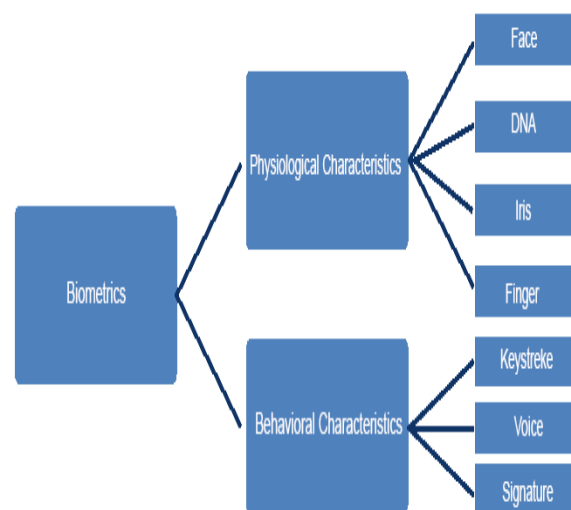


Figure 2: Physiological Versus Behavioural Characteristics

II. TOOLS & TECHNOLOGY

Edge Detection

In order to make the biometric detection fast we need the use of Edge detection mechanisms. These may be canny, sobel, prewitt and Robert. The best among them is canny based edge detection. The physiological characteristics are considered in this research the objective of research is to provide fast and more efficient biometric security to the cloud based systems.

In case of canny based edge detection John Canny considered mathematical problem of deriving an optimal smoothing filter given criteria of detection, localization & minimizing multiple responses to a single edge. He showed that optimal filter given these assumptions is a sum of four rapidly growing terms.

He also showed that this filter could be well approximated by first-order unoriginal of Gaussians. Canny also introduced notion of non-maximum suppression, which means that given pre smoothing filters, edge points are as points where gradient magnitude assumes a local maximum within gradient direction.

Looking for zero crossing of 2nd derivative along gradient direction was first proposed by Haralick.^[9] It took less than two decades to find a modern geometry variation meaning for that operator that links it to Marr–Hildreth (zero crossing of Laplacian) edge detector. That observation was presented by Ron Kimmel & Alfred Bruckstein.

The use of canny based edge detector would reduce the size of biometric sample as well as it provide quality output. The comparison process of biometric sample becomes fast as the unnecessary part of biometric sample is removed during edge extraction. Only the useful part is compared that result in space saving and time saving process.

III. PROPOSED WORK

In proposed work to provide security to the remote cloud biometric data is acquired & analyzed & validated after transmission, signal processing, decision making & storing. Matlab has been used as simulation environment. In order reduce the size of image and comparison time edge detection techniques such as canny algorithm would be used to find edge of samples & get matrix representation of stored images of faces or Finger prints. Then

various graphical techniques would be used to compare & comparison would be represented in form of Histograms.

Data Acquisition

Data collection involves use of sensors to detect & measure an individual's physiological or behavioural characteristics. Biometric feature must have following characteristics:-

Universality, which means that every person should have characteristic, Uniqueness, two persons should not have same term or measurement of characteristic Permanence, characteristic should be invariant with time, Measurability.

Validity of Test Data

Here, it checks for validity of processed data & decides whether person is authorized or not. Testing biometrics is difficult, because of extremely low error rates involved.

PROPOSED MODEL

In our proposed work we have integrate cloud with database, remote application with biometric based security. The objective of proposed work is to reduce the time consumption during sample comparison as well as the size of biometric samples.

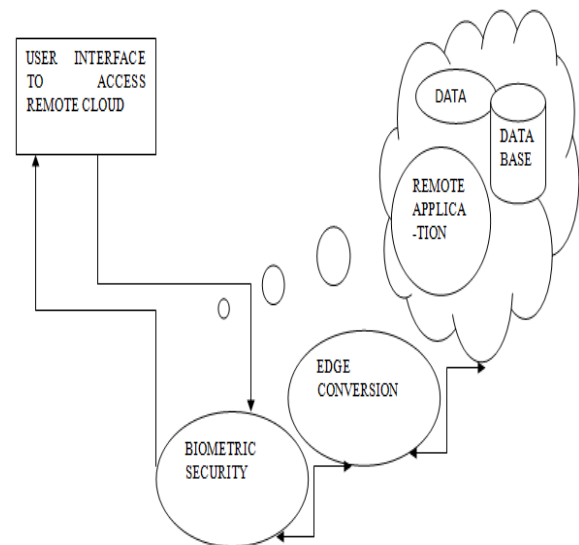


Figure 3: Proposed Model

IV. RESULT & DISCUSSION

Image Processing In Matlab Using Edge Detection Mechanism

In Matlab we have used canny based edge detection to find edges of palm as it is consider

better than other edge detection mechanisms. Here we have make comparison in edge detection by sobel and canny. First an image is taken.



Figure 4: Existing Image(palm.jpg)

Following is the Code to Implement Sobel Operator:-

%Following code would read image matrix and store in im

```
im=imread('palm.jpg');
```

% the image is displayed here

```
imagesc(im);
```

%Following code would read image matrix and store in im

```
im=imread('palm.jpg');
```

% In Following code image is stored in rgb2gray

```
img=rgb2gray(im);
```

%Following code would extract sobel image from sob_im.

```
sob_im=edge(img,'sobel');
```

```
figure(2);
```

%Sobel image is displayed on screen

```
imagesc(sob_im);
```

```
axis('square');
```

```
colormap('gray');
```

```
imshow(sob_im);
```

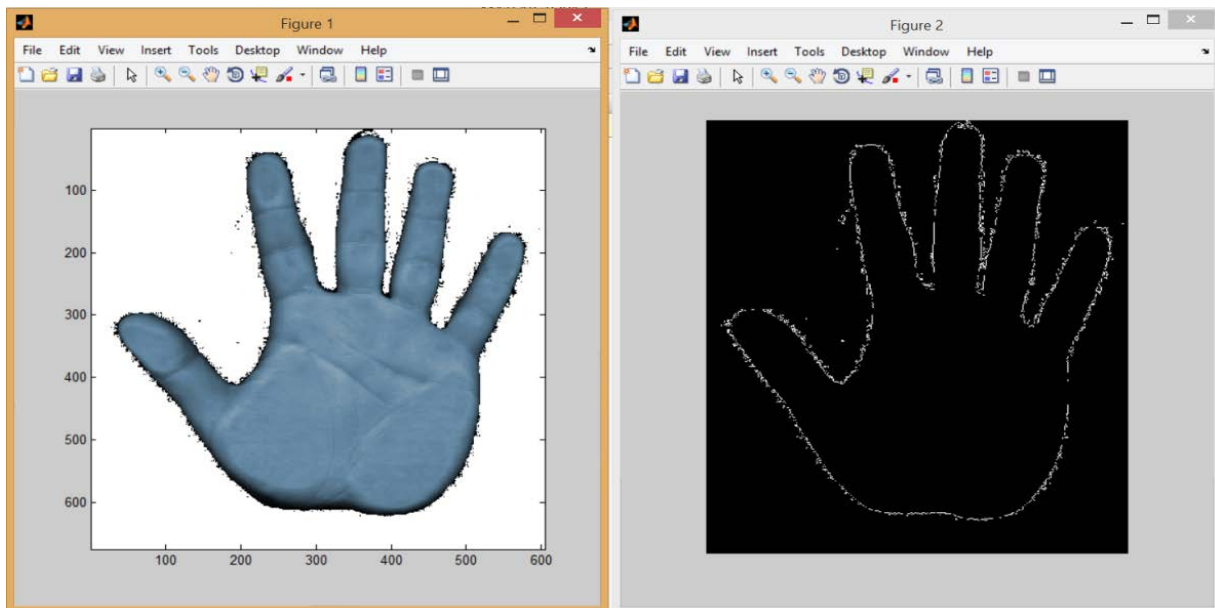


Fig 5 Image(palm.jpg) After Applying Sobel Operator Based Matlab Code

The above code is saved with .m extension. When we run application then following window appears. Here we have compared the original image with edge based image in both cases sobel based and canny based.

Canny Based Edge Detection

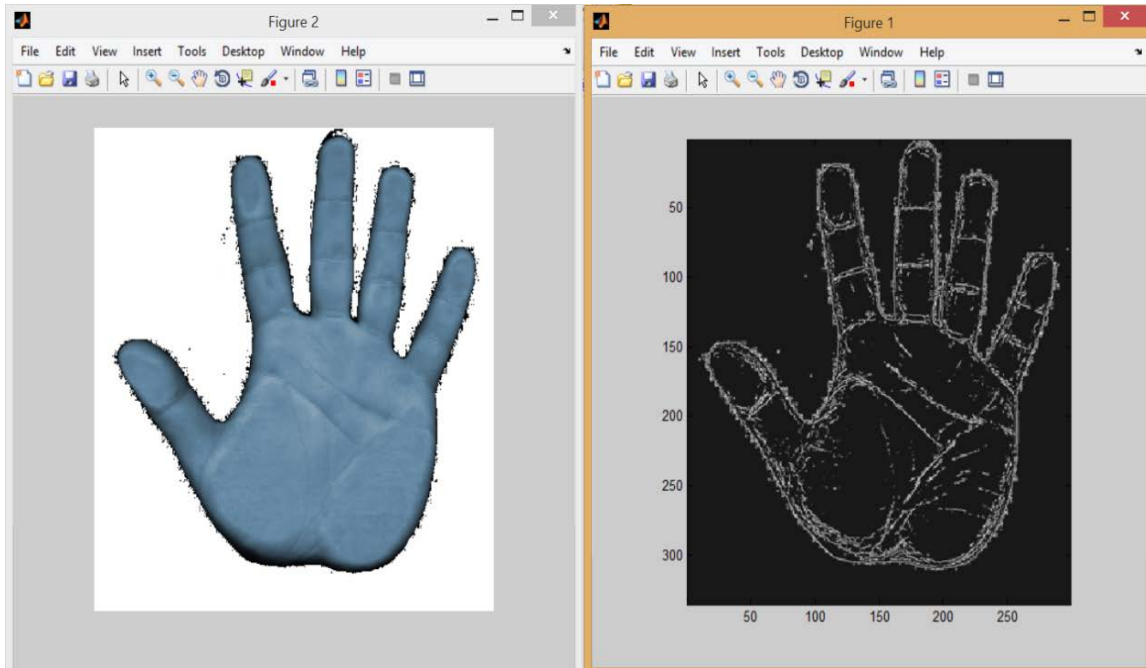


Figure 6: Image(palm.jpg)After Applying Canny Based Edge Detection in Matlab

Above biometric system is providing security to the web based wallet on remote cloud server. The amount received, paid and balances are maintained on this remote portal that is made secure with integration of biometric.

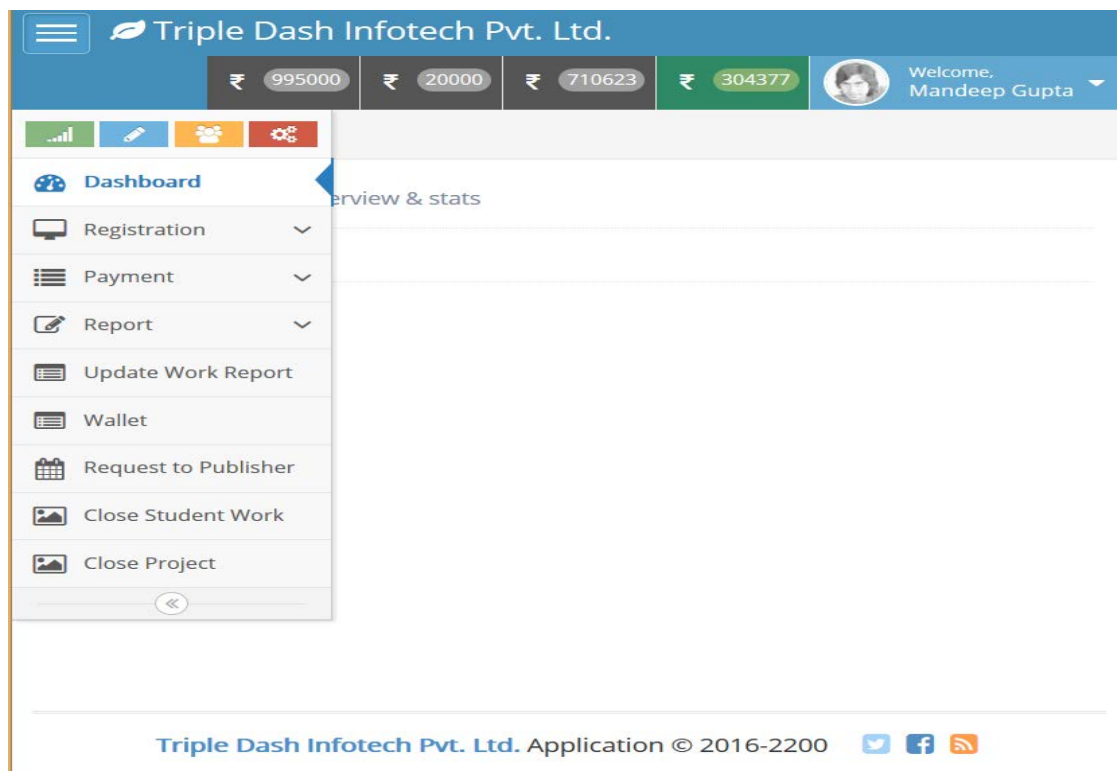


Figure 7: Fund management system

The registration of student are made here and with their course, general detail and the fees of their course.

Triple Dash Infotech Pvt. Ltd.

₹ 995000 ₹ 20000 ₹ 710623 ₹ 304377 Welcome, Mandeep Gupta

Home > Dashboard

Dashboard » Student Registration Form

1163 Course/Topic name *

Student Name

Father Name

Mother Name

Email ID

Mobile No

Total Course Fee *

Address

College & Uni. Name

Other Details

Create Reg.

Show 10 entries Search:

Figure 8: Student admission Form

The record of payment is maintained here. User could make transaction and view the report.

Triple Dash Infotech Pvt. Ltd.

₹ 995000 ₹ 20000 ₹ 710623 ₹ 304377 Welcome, Mandeep Gupta

Home > Dashboard

Dashboard » Student Payment

222

Select Student Uni. ID

Select Payment For

Enter Amount

Payment Type with Description

Add Payment

Student Details
Name:-
Mobile No:-
Address:-
Publisher Details
Name:-
Mobile No:-
Email ID:-

tid	s_id	s_name	payment	pay_date	pay_type	pay_for	remark
221	1162	Ravi Kumar	20000	06-16-17 16:43:10	By Axis Bank	Payment For Course	
220	1125	Sonia Devi	3000	06-16-17 16:36:57	Paytm	Payment For Course	
219	1075	Madhu Bala	2000	06-16-17 16:36:04	By Online	Payment For Course	
218	1067	Gunjan	1200	06-15-17 16:34:57	By Paytm	Payment For Paper	
217	1095	Kavita Dull	6000	06-13-17 16:20:39	By Online	Payment For Course	
216	907	Swati	4700	06-13-17 15:41:43	By IDBI	Payment For Paper	

Figure 9: Student Payment System

Payment received from party are represented in following window

Tranjection ID	Party ID	Party Name	Amount	Tranjection Date	Payment Details	Remarks
1	2	Sandeep Sandhu	5000	12-02-16 13:40:01	wallet payment	

Figure 10: Party Payment System

V. CONCLUSION

As we can conclude from above result that the use of edge detection image would increase the security of cloud based servers. The need of cloud is increasing daily. People who use web services on cloud services require the security to their data. They take advantage of remote storage and remote services from cloud based systems. Such systems could be beneficial for users as they need not keep data on their own computer. They access files remotely from cloud servers. They also run their application on remote clouds. Security is provided to the remote cloud from hackers. This technique would provide security to mobile, laptops, tablets and personal computers that are connected to cloud servers.

REFERENCES

1. K. Jain, A. Ross, & S. Pankanti, "Biometrics: A Tool for Information Security", IEEE Transactions on Information Forensics & Security, Vol. 1, No. 2, 2006, pp. 125-143.
2. J. Daugman, "New Methods within Iris Recognition", IEEE Trans. on Systems, Man, & Cybernetics, Vol. 37, No. 5, 2007, pp. 1167-1175.
3. R. Wildes, "Iris Recognition: an Emerging Biometric Technology", Proceedings of IEEE, Vol. 85, No. 9, 1997, pp. 1348-1363.
4. W. Boles, & B. Boashash, "A Human Identification Technique Using Images(pictures) of Iris & Wavelet Transform", IEEE Trans. on Signal Processing, Vol. 46, No.4, 1998, pp. 1185-1188.
5. W. Kong, & D. Zhang, "Accurate Iris Segmentation Based on Novel Reflection & Eyelash Detection Model", within International Symposium on Intelligent Multimedia, Video & Speech Processing, 2001, pp. 263-266.
6. L. Ma, & T. Tisse, "Personal Recognition Based on Iris Texture Analysis", IEEE Trans. on PAMI, Vol. 25, No. 12, 2003, pp. 1519-1533.
7. N. Schmid, M. Ketkar, H. Singh, & B. Cukic, "Performance Analysis of Iris Based Identification System Matching Scores Level", IEEE Transactions on Information Forensics & Security, Vol. 1, No. 2, 2006, pp. 154-168.
8. V. Dorairaj, A. Schmid, & G. Fahmy, "Performance Evaluation of Iris Based

- Recognition System Implementing PCA & ICA Encoding Techniques", within Proceedings of SPIE, 2005, pp. 51-58.
9. C. Fancourt, L. Bogoni, K. Hanna, Y. Guo, & R. Wildes, & N. Takahashi, & U. Jain, "Iris Recognition at a Distance", within Proceedings of International Conference on Audio & Video-Based Biometric Person Authentication, 2005, pp. 1-13.
 10. "CASIA Iris Image Database", Chinese Academy of Sciences Institute of Automation. <http://www.sinobiometrics.com>
 11. E. Yahya, & M. J. Nordin, "A New Technique for Iris Localization within Iris Recognition System", Information Technology Journal, Vol. 7, No. 6, 2008, pp. 924-928.
 12. L. Masek, "Recognition of Human Iris Patterns for Biometric Identification", Measurement, Vol. 32, No. 8, 2003, pp. 1502-1516.
 13. M. Clark, A. C. Bovik, & W. S. Geisler, "Texture segmentation using Gabor modulation/demodulation", Pattern Recognition Letters, Vol. 6, No. 4, 1987, pp. 261-267.
 14. M. R. Turner, "Texture discrimination by Gabor functions", Biological Cybernetics, Vol. 55, No. 2, 1986, pp. 71-82.
 15. Poursaberi, & B. N. Araabi, "An iris recognition system based on Daubechies's wavelet phase", within Proceedings of 6th Iranian Conference on Intelligent Systems, 2004.
 16. Y. Chen, M. Adjouadi, A. Barreto, N. Rishe, & J. Andrian, "A Computational Efficient Iris Extraction Approach within Unconstrained Enviroments", within BTAS'09 Proceedings of IEEE International Conference on Biometrics: Theory, Applications & Systems, 2009, pp.17-23.
 17. S. Shah, & A. Ross, "Iris Segmentation Using Geodesic Active Contours", IEEE Trans. on Information Forensics and Security, Vol. 4, No. 4, 2009, pp. 824-836.
 18. Anil K Jain, "Biometric Authentication: How Do I Know Who You Are".