

Implementation of IOT Based Financial Wallet Security in Industrial Automation

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ARTICLE DETAILS

Article History

Published Online: 15 May 2019

Keywords

IOT, industrial automation, Edge Detection Mechanism, Canny.

ABSTRACT

The Objective of our research is to set up security system that is IOT based in order to provide financial security of industries at remote location. This research has concentrated on establishment of cloud environment to host IOT application. Then the development of IOT Application using Asp.net within C# programming platform has been undertaken. Proposed work has deployed IOT application on cloud environment and it has used that system for security of organization. Proposed work has considered consider Speed of system, Technical Feasibility of system, Economical Feasibility of system, probability of errors factors to check efficiency of proposed system. The use of edge detection mechanism has been found fruitful for the proposed work.

1. Introduction

Many definitions of Internet of Things include physical items or maybe products that might sense or affect bodily environment. IoT comes with virtual objects, like electronic tickets, books, agendas, wallets. The Internet of Things comes with individuals - this's particularly crucial in areas including home automation, in which humans can control environment via mobile applications. Through services, like cloud services, massive volumes of information ("big data") have been processed & transformed into information that is useful, innovative applications are designed & run & business procedures are now being enhanced by integrating device data as shown below.

Internet of things in addition requires IoT Platforms type of middleware that's utilized to link IoT components (objects, services, people, etc.) to Internet of things. IoT platforms provide many functions, like entry to products, ensuring suitable installation & behavior of device, data analytics, interoperable link to hometown network, additional devices or cloud. Lastly, almost all of parts in an IoT atmosphere must be linked together by networks through different wireless & wire line technologies, standards, protocols to offer pervasive connectivity. IOT has numerous benefits into the lives of ours which can assist people, business and culture on regular basis. The brand new idea of its could be offered in many types which includes security, financial matters, health, & planning of every day. IOT Integration in healthcare system is usually really advantageous for both single & society.

2. Welcome to World of Internet of Things

The Internet of things is removing mundane recurring tasks & producing items which aren't likely before allowing far more individuals to do much more satisfying things & leaving models to perform repetitive jobs. The word 'Internet of Things' was initially put forward by Kevin Ashton as label of presentation he made at Gamble and Procter within 1999. Also called Internet of Everything, it's suggested setup within that existing, daily in animate objects as appliances and machines & also pets and men and women will be attached within network & would be ready to exchange information. Machines

and objects will be ready to transmit & receive messages to one another, eliminating treatment of people. Every unit hooked up to Internet of Things will be uniquely displaying its IP address. IPv6 need to be utilized as this network type would produce enormous requirement of IP addresses & currently used Ipv4 is incapacitated to involve them. Brain of these items is sensors. These receptors are micro electro mechanical systems (MEMS) which would react to change in temperature, weight, humidity, sound, motion, pressure, time, light, etc. & take action that is essential that they're programmed to. This info could also be delivered to information center where it might be examined. Thus, process of managing or maybe using different tools, machinery, additional applications and manufacturing processes using various control systems & also within less or perhaps no human treatment is called as automation. You will find numerous types of automation based upon program they might be grouped as home automation, industrial automation, autonomous automation, building automation etc. Today let us see several of uses of Internet of things.

3. Objective

The Objective of our research is to set up an Infrared Array Sensor system that is IOT based in order to provide security at remote location. This research would concentrate on Following

1. Establishment of cloud environment to host IOT application.
2. Development of IOT Application using Asp.net within C# programming platform.
3. Integrate IOT within Infrared Array sensors in order to implement proposed work.
4. Deploy IOT application on cloud environment.
5. Use that system for security of organization.
6. Testing efficiency of system within existing on.
7. We would consider following factors to check efficiency of proposed system.
 - a. Speed of system.
 - b. Technical Feasibility of system
 - c. Economical Feasibility of system
 - d. Consider probability of errors

e. Retain quality of data stream after compression.

4. Proposed Work

MULTIPLE CAMERAS: Multiple Cameras have been used in order to capture the snapshot of objects from two different dimensions

IMAGE COMPRESSION MODULE: The each captured picture size would be reduced using scale function in MATLAB

EDGE FIND OR: Canny based edge find or would extract only edge based part of image.

IMAGE DATABASE: The picture database would store consecutive images one by one.

IMAGE COMPARATOR: The role of comparator is to compare in with in-1 and xn with xn-1. If there is any mismatch then information is send to IOT.

PHYSICAL VAULT SECURITY SERVER ON CLOUD: Physical Vault security server capture the notification from picture comparator if there is any suspicious activity.

AUDIO PLAYER MECHANISM: This mechanism would play audio after find ing suspicious activity on web page

5. Result And Discussion

Here it has been discussed the implementation of Security of Physical Vaults for grid array sensor module for security purpose. Here we have used MATLAB & ASP.NET for implementation purpose. Matlab has been used to capture picture using camera & compare current picture with previous one in order to find changes. Following is picture capturing module developed in Matlab.

PICTURE CAPTURING MODULE

Following module capture picture from camera & store on disc in form of .jpg file

Here xx1 store number of file for comparison purpose

1. Following code is to capture video using camera

```
vid = videoinput('winvideo');
preview(vid);
start(vid);
set(vid, 'ReturnedColorSpace', 'RGB');
```

i. After taking video snapshot are taken using this command:-

```
im = getsnapshot(vid);
2. Following code resize picture in order to compress
This so that This could take less space
im1=imresize(im,0.20);
imshow(im1);
3. The captured picture is stored in file with This s
sequence number on disc.
imwrite(im1, strcat('F',x11, '.jpg'));
stop(vid);
delete(vid);
```



Fig 1 Frames captured in sequenc

PICTURE COMPARISON MODULE

Now in order to compare picture stored after capturing using camera are converted into edges using canny based edge detection mechanism & and compared using ait_picmatch functions to get whether picture is same or not.

```
1. Following code would read picture In
x=imread(strcat('C', x11 , '.jpg'));
2. Following code would convert picture to edge based
version of picture using canny technology.
t=canny(x,1,1,1);
3. Following code would read picture In+1
x1=imread(strcat('C', x11+1 , '.jpg'));
t1=canny(x1,1,1,1);
```

Comparative analysis of Time consumption during comparison in tradition & proposed comparison system

```
x=[10 20 30 40 50 60 70 80];
y=[3 3 4 4 5 6 7];
y1=[1 1 2 2 3 3 3 4];
hold on;
plot(x,y,'r+-');
plot(x,y1,'b+-');
title('Comparative Analysis snapshot comparison delay of
Proposed & traditional work');
xlabel('Snapshots');
ylabel('Time Taken Sec');
legend('Traditional', 'Proposed');
```

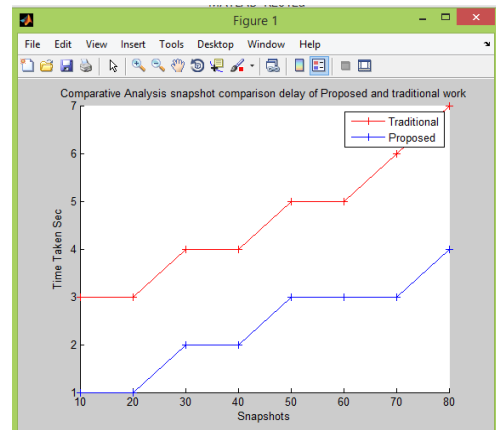


Fig 2 Comparative analysis of Time consumption in tradition & proposed comparison system

Comparative analysis of Queuing delay in tradition & proposed comparison system

```
x=[10 20 30 40 50 60 70 80];
y=[6 6 9 9 11 11 13 13];
y1=[3 3 4 4 4 4 5 5];
hold on;
plot(x,y,'r+-');
plot(x,y1,'b+-');
title('Comparative Analysis Queuing delay of Proposed &
traditional work');
xlabel('Snapshots');
ylabel('Time Taken Sec');
legend('Traditional', 'Proposed');
```

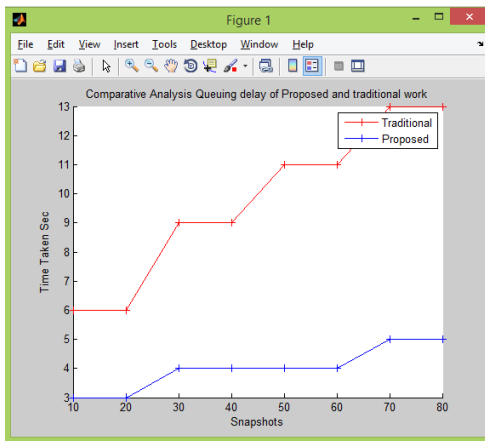


Fig 3 Comparative analysis of Queuing delay in tradition & proposed comparison system

Comparative analysis of File Size in tradition & proposed comparison system

```
x=[10 20 30 40 50 60 70 80];
y=[4020 8090 12100 16201 20300 24200 29002 33100];
y1=[1020 2050 3600 4201 5100 6300 7210 8543];
hold on;
plot(x,y,'r+-');
plot(x,y1,'b+-');
title('Comparative Analysis File Size of Proposed &
traditional work');
xlabel('Snapshot');
ylabel('File Size Kb');
legend('Traditional', 'Proposed');
```

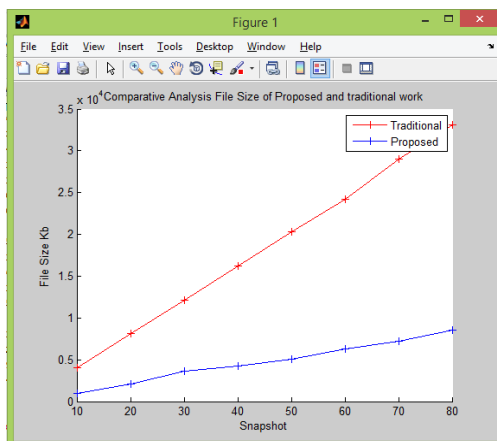


Fig 4 Comparative analysis of File Size in tradition & proposed comparison system

6. Conclusion

This research would establishment of cloud environment to host automated application. Implementation of picture capturing module works from two different dimensions to toobost the security. The size of captured frame sample would be reduced in order to savethe storage space. Secondly any suspicious activity would be traced more quickly using edge detection mechanism during frame comparison in order to make system fast. After identification of suspicious activity signal would be forward to trigger the alarm so that urgent action could be made in reduce the changes of loss.

In picture comparator the picture would be compare using picture comparison mechanism in Matlab. Here the matrix of picture are captured and compared if the content is matched then there is no suspicious activity. Otherwise signals would be sent to physical Vault security on cloud. In physical Vault security on cloud, after find ing suspicious activity signal is sent to remote cloud through web application. Event database gets updated & actuator is connected to database. Time by time a clock signal checks updates in database & responds to voice player.

7. Future Scope

This technological innovation had wide range of uses with in different fields' smart cities, home automation, Industrial Health and Automation Monitoring. IOT sensor opens the door to an enormous number of innovative programs, ranging from energy cost savings in the lighting effects industry, household appliances, security and safety systems, and the healthcare industry. Additional examples normally include hot spot identification, human identification inside vehicles for contactless temperature and customer comfort measurement in manufacturing applications.

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