

IMPLEMENTATION WORK ON IOT WITH GRID COMPUTING IN INDUSTRIAL AUTOMATION

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Abstract: In this research, the use of applications of various devices those are related to IOT has been discussed. In the research the implementation of image capturing module has been made from two different dimensions. The deployment of IOT application on grid environment has been made. The implementation of Security of Physical Wallets is made for grid array sensor module for security purpose. Several cameras are used to fetch the image and MATLAB is used for implementation purpose as well as compression of image. The canny edge detector is used to eliminate the useless part of image. The research work would be beneficial to integrate the IOT within Infrared Array sensors in order to implement proposed work. In future time, it would be beneficial for those who want to know about implementation of image capturing module from two different dimensions. It would deploy the IOT application on cloud environment. The paper has been proposed the system for security of organization. It would also offer a way of to increase Testing efficiency of system within existing on.

Keyword: IOT, Canny Edge Detector, Matlab, Image Compression, Grid Computing

[1] INTRODUCTION

The Internet as we know it is defined as an interconnection of worldwide networks .It came about in the early 80's. As end users, we also know that the most interesting part of this network is not the infrastructure itself, but the smart devices and smart applications that it connects with and that make our work easier and our life better. The Internet started to connect computers, mobile phones, and more recently tablets, and Smartphone. The expression "Internet of Things," abbreviated as "IoT," consists of an important word: the word "Things." This word highlights the fact that the Internet is now also connecting any sort of object on the planet. Internet of Things devices (or nodes) often operate without a screen or any user interface at all, may rely on battery power for operation, and are usually dedicated to a single task. Internet of Things devices are typically described as "smart objects, edge devices, or connected devices

Major Components of IoT



Fig 1 Major Components of IOT

[2] GRID COMPUTING

Grid computing has been determined as computer network. In this, the resources of computer are distributed in every other computer in the system. The Processing power, memory and data storage all community resources are shared in the users. It

authorized the users tap into and influences the particular type of tasks.

From the fundamental point of view grid computing is basically a computer network. In this each and every computer's resources are distributed to all other computer which is present in that system. The Processing power, memory and data storage all community resources are shared in the users. It authorized the users tap into and influences the particular type of tasks.

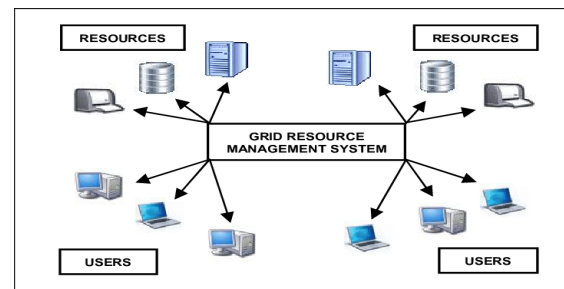


Fig 2 Grid Resource Management Systems

Grid computing is based on an open set of standards and protocols like Open Grid Services Architecture (OGSA). These enable communication across heterogeneous and geographically dispersed environments. Different types of facilities are provided by grid computing, due to which organisations can make computing and data resources more optimal, group them so that they can handle burden of assignments, distribute them across networks due to which teamwork becomes possible.

[3] BENEFITS OF GRID COMPUTING

A steep amount of computing power is provided by grid computing. By the utilization of grid



computing in various crucial business related work a great advantage has been gained by enterprises. It increases speed of completion. Due to grid computing both output and cooperation are increased. It improves cooperation and working elasticity because it bring in computer resources and human being together. It allows widely dispersed departments and businesses to create virtual organisations to share data and resources. One of the important advantage which is offered by grid computing to end users is free and easy approach to computing, information and storage. By the utilization of grid computing workers can easily go through the phase of product design, research projects and so on.

[4]MOTIVATION OF RESEARCH

1. To study the use of applications of various devices those are related to IOT
This research has focused on the application of different devices that are used in internet of things.
2. To study impact of IOT on the society is also an considerable objective, especially the changes in society due to IOT. Research has studied the influence of internet of things on the social and professional environment. Here the objectives of IOT are considered. The research also focused on the effect in society due to advent of IOT.
3. To establish grid based environment to host IOT application
4. Research has integrated grid computing with IOT where Grid computing has been determined as computer network. In this, the resources of computer are distributed in every other computer in the system. The Processing power, memory and data storage all community resources are shared in the users. To make Implementation of image capturing module from two different dimensions.
5. To deploy IOT application on grid computing environment.
6. To use system for security of organization
7. To provide a way of to increase Testing efficiency of system within existing on.

[5]PROPOSED WORK

1. **USING SEVERAL CAMERAS:** Several Cameras are utilized to fetch snapshot of things from multiple dimensions. First device picks snaps i1,i2,i3.....in. Another device picks snaps x1, x2, x3...xn. Chance of frauds by dodging single side camera is reduced using this mechanism.

2. **COMPRESSION OF GRAPHICAL DATA:** Captured graphic size is minimized. It is performed by scale function in MATLAB. imresize() function is used here.
3. **EDGE DETECTOR:** Canny based edge detector is capable to get edge of graphics. This eliminates useless part of image. Such mechanism also minimizes useless part of graphics.
4. **GRAPHICAL DATABASE:** Graphical database is capable to collect consecutive images. The process flow of proposed model is represented in following image.

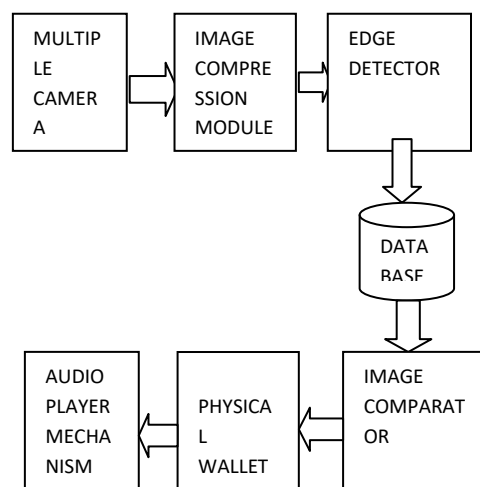


Fig 3 Proposed model of image compression module

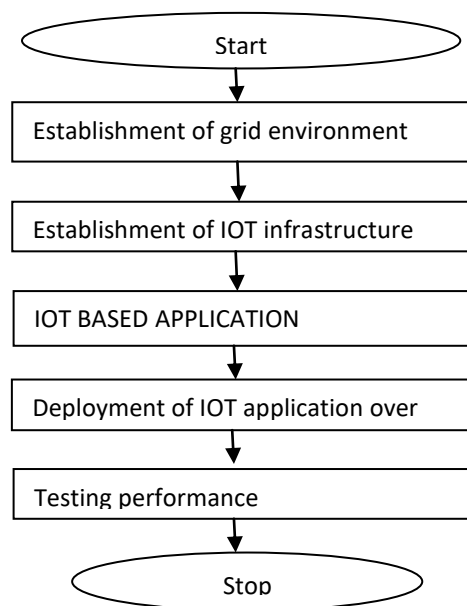


Fig 4 Process flow of proposed work

[6] IMPLEMENTATION WORK

The implementation of Security of Physical Wallets is made for grid array sensor module for security purpose. Following figure show the image captured from camera. Here the MATLAB is used for implementation purpose. Matlab has been used to capture image using camera & compare current image with previous one in order to detect changes. Following is image capturing module developed in Matlab.

Image Capturing Module

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

Here xx1 store number of file for comparison purpose

Following code is to capture video using camera

```
vid = videoinput('winvideo');
preview(vid);
start(vid);
```

```
set(vid, 'ReturnedColorSpace', 'RGB');
```

after taking video snapshot are taken using this command

```
im = getsnapshot(vid);
```

Following code resize image in order to compress it so that it could take less space

```
im1=imresize(im,0.20);
imshow(im1);
```

The captured image is stored in file with its sequence number on disc.

```
imwrite(im1,strcat('F',x11,'.jpg'));
stop(vid);
delete(vid);
```



Fig 5 Frames captured in sequence

Image Comparison Module

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

Following code would read image In

```
x=imread(strcat('C', x11 , '.jpg'));
```

Following code would convert image to edge based version of image using canny technology.

```
t=canny(x,1,1,1);
```

Following code would read image In+1

```
x1=imread(strcat('C', x11+1 , '.jpg'));
```

```
t1=canny(x1,1,1,1);
```

Compare both edge based version of image using ait_picmatch

```
rrr1=ait_picmatch(t,t1);
```

rrr1 variable represent how much image is matching with different image.

If rrr1 mismatches then signal is set to IOT interface

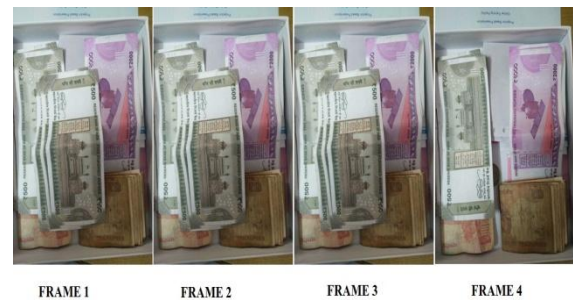


Fig 6 Comparison made for frame n with frame n+1

Edge based image of frame 3 is compared with edge based image of frame 4 are result in mismatch of frame & signal is sent to IOT interface



Fig 7 Edge Based Image

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

```
x=[11 22 33 44 55 66 77 88];
```

```
y=[4 4 5 5 6 7 8 9];
```

```
y1=[2 2 3 3 3 4 4 5];
```

```
hold on;
```

```
plot(x,y,'r+-');
```

```
plot(x,y1,'b+-');
```

```
title('Comparison of delay in case of Proposed &
traditional work');
xlabel('Images');
ylabel('Time in Second');
legend('Traditional', 'Proposed');
```

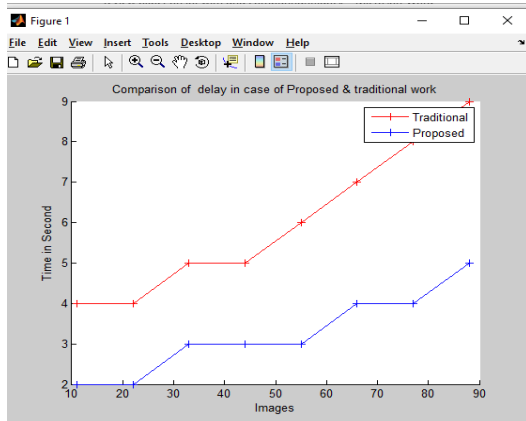


Fig 8 Comparative analysis of Delay in tradition & proposed comparison system

Comparison of Time consumption in tradition & proposed comparison system

```
x=[11 22 33 44 55 66 77 88];
y=[5 5 8 8 10 10 11 11];
y1=[2 2 3 3 4 4 5 5];
hold on;
plot(x,y,'r+-');
plot(x,y1,'b+-');
title('Comparison of Processing delay of Proposed
& traditional work');
xlabel('Images');
ylabel('Time in Second');
legend('Traditional', 'Proposed');
```

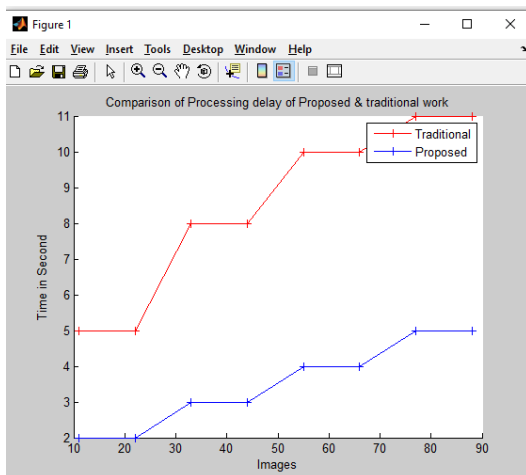


Fig 9 Comparative analysis of overall Time consumption in tradition & proposed comparison system

Comparative analysis of Queuing delay in tradition & proposed comparison system

```
x=[11 22 33 44 55 66 77 88];
y=[6 7 9 10 11 12 13 14];
y1=[3 3 4 4 5 5 6 6];
hold on;
plot(x,y,'r+-');
plot(x,y1,'b+-');
title('Comparison of Queuing delay of Proposed &
traditional work');
xlabel('Snapshots');
ylabel('Time Taken Sec');
legend('Traditional', 'Proposed');
```

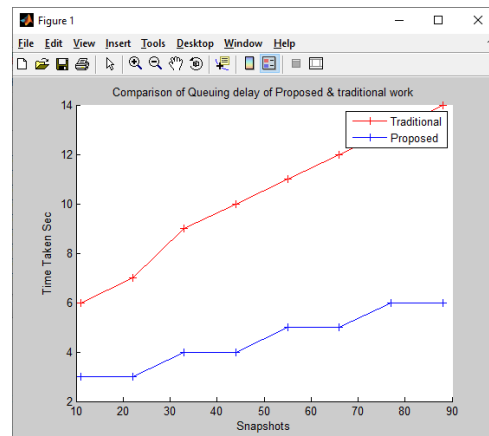
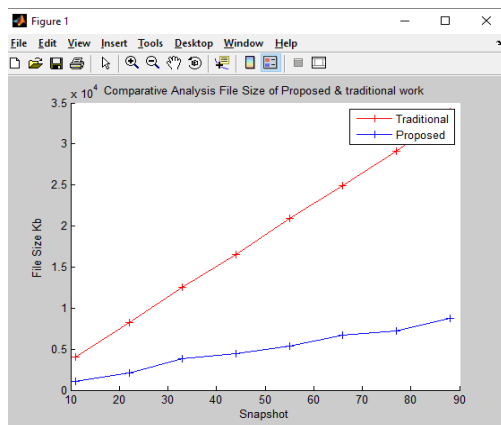


Fig 10 Comparative analysis of Queuing delay in tradition & proposed comparison system

Comparative analysis of File Size in tradition & proposed comparison system

```
x=[11 22 33 44 55 66 77 88];
y=[4050 8190 12500 16501 20900 24900 29102
33900];
y1=[1050 2100 3800 4401 5400 6700 7220 8743];
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

11 Comparative analysis of File Size in tradition & proposed comparison system

[7]CONCLUSION

In this research, the use of applications of various devices those are related to IOT has been discussed. Here the study impact of IOT on the society is also a considerable objective, especially the changes in society due to IOT. Here the establish cloud environment to host IOT application has been described. In this research the development of IOT Application using MATLAB platform has been performed. The IOT has been integrated within Infrared Array sensors in order to implement proposed work. In the research the implementation of image capturing module has been made from two different dimensions. The deployment of IOT application on grid environment has been made. The use system has been used for security of organization. The paper is providing away to increase Testing efficiency of system within existing on.

[8]SCOPE OF RESEARCH

The proposed work would provide the study the use of applications of various devices those are related to IOT. It would offer the study impact of IOT on the society is also a considerable objective, especially the changes in society due to IOT. It would be helpful to establish grid environment to host IOT application. The proposed work has developed the IOT Application with the use of MATLAB programming platform. The research work would be beneficial to integrate the IOT within Infrared Array sensors in order to implement proposed work. In future time, it would be beneficial for those who want to know about implementation of image capturing module from two different dimensions. It would deploy the IOT application on cloud environment. The paper has been proposed the system for security of organization. It would also offer a way of to increase Testing efficiency of system within existing on.

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