

# Imperium Management

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**Abstract**—The proposed system is based on image processing and embedded to develop a system in the seminar hall / classroom in order to reduce electricity wastage. There is no need of a centralized control room as the system will be automatic. In this direction of controlling, the wastage of power will be reduced. The methods that are used in this project are designed the circuit, write a code, simulation, synthesis and implement in hardware. In this project, AVR studio Software is chosen to write assembly C coding and MATLAB is used to write code for DIP part.

We have designed a system which automatically operates the AC/fan, light and manages the power. Using CCTV / webcam we will capture the image of hall/classroom and using Camshift algorithm human will be detected and this will be given as input to atmega16. Different temperature and light sensors are used. The controller will then check them and later the connection to relay will be done accordingly, which will turn on the Fan/ AC, lights automatically if necessary. This whole system will help in reduction of the power wastage thus saving the electricity. This system is economical.

**Index Terms**— AVR algorithm , CAMSHIFT algorithm, face detection, and object detection.

## I. INTRODUCTION

Power Management refers to efforts made to reduce energy consumption in order to preserve resources for the future and reduce environmental pollution.

Individuals and organizations that are direct consumers of energy choose to conserve energy to reduce energy costs and promote economic security. Power Management refers to efforts made to reduce energy consumption in order to preserve resources for the future and reduce environmental pollution. Energy conservation can be achieved through the increased efficient energy use, in conjunction with decreased energy consumption and/or reduced consumption of conventional energy sources

Power Management can result in increased financial capital, environmental quality, national security, personal security, and human comfort. Individuals and organizations that are direct consumers of energy choose to conserve energy to reduce energy costs and promote economic security. Industrial and commercial users can increase energy use efficiency to maximize profit. This paper describes part of a larger program to develop a real time human detection. We want to give the computers the ability to track the human in a particular section of the area and count the number of people.

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## II. METHODOLOGY

### A. BLOCK DIAGRAM:

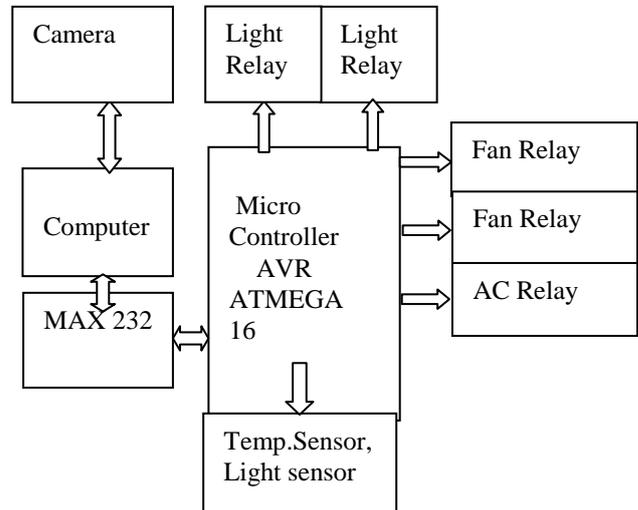


Fig: Block Diagram of System

### B. BLOCK DIAGRAM DESCRIPTION:

This system will consist of Image processing using MATLAB at PC and Micro controller circuit. Initially the PC will take the image through the camera and find out the presence of the student using image processing. The PC will also detect the section in which the students are present.

If there is no one in the hall, the PC will send corresponding command to the micro controller. The controller will then switch off all the lights and fans in the hall. If PC detects any presence in a particular section, it will send the command to the controller. The controller will then check the temperature and turn on the fan if necessary. Then light sensor belonging to the corresponding section is checked and the light is turned on.

### C. CAMSHIFT ALGORITHM :

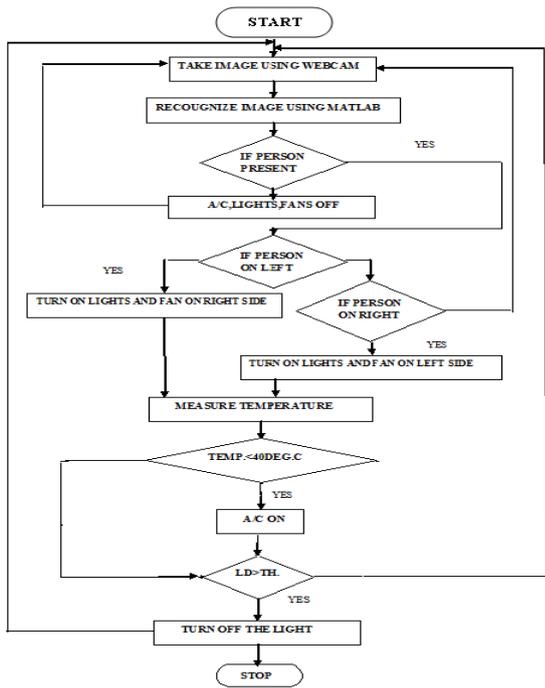
CAMSHIFT is being used as a face tracker. By inserting face control variable. This methodology has been tested extensively in a series of demos with over 30 different users. Head tracking via CAMSHIFT has also been used to experiment with immersive 3D graphics control in natural head movement are translated into moving the corresponding 3D graphic camera viewpoint.

### D. ALGORITHM OF A SYSTEM :

1. Start.
2. Take image using web cameras.
3. Recognize the image using MATLAB.
4. By using a MATLAB program to detect the number of persons present in a room by face detection. If no one is present

5. Switch off AC, light, fan.
6. If a person presents on the left side of the image.
7. Turn ON light and fan which is on the right side of the room.
8. Else if the person presents on the right side of the image then switch ON light and fan present on the left side of the room.
9. Measure temperature.
10. If the temperature  $>40\text{deg.C}$
11. Switch ON AC.
12. If light density (LD)  $>$  threshold (Th).
13. Turn OFF the light.
14. Go to step 2.
15. Stop

**E. FLOWCHART:**



**III. RESULT:**

- As shown below , We have detected face by using the CAMSHIF algorithm in MATLA

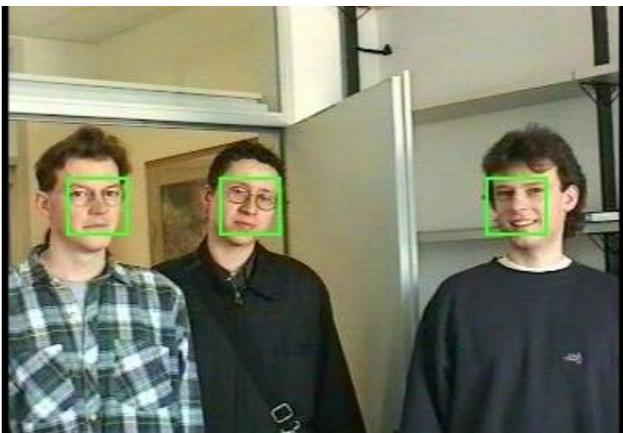


Fig: Face detection

- The above result window shows, the start and stop buttons to manually start and stop the video.

- According to scaling factor, the window scans the image regularly. The detection of the upper part of the body takes place.
- By using these detected faces (from picture) we have considered a number of persons present in left side and right side of the roo.



Fig: Left side's light and fan are switched ON

- As shown in picture person is present at the right side of the image so we will switch on light and fan which are on the left side of the room automatically.

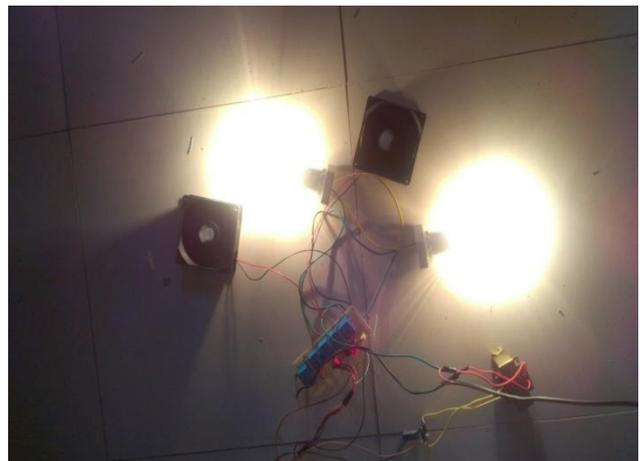


Fig: All lights and Fans are switched ON

- If daylight is present in the room, then the system will switch off lights in room and the facility is provided in a system that if the room temperature is greater than 40degree then A/C will work.

**A. BRIEF SUMMARY OF RESULT:**

The table below gives a brief summary of the different status of electrical appliances according to people present in different sections of the hall.

Sr. No	People Present	Status
1.	No person present	No electrical appliances are switched ON
2.	Person present in Right section of Hall	Light and Fan on right section are switched ON
3.	Person present in the left section of Hall	Light and Fan on left section are switched ON

4.	Persons present in both sections of Hall	All Lights and Fans in the hall are switched ON
5.	When person present in any section of the hall and Room temperature $\geq 40$ deg. C	A/C is switched ON

#### IV. CONCLUSION :

CAMSHIF is simple, computationally efficient probability distribution based object tracker fast enough to be used as part of a perceptual user interface. Despite its simplicity, CAMSHIFT still handles some basic computer-vision tracking problem

- A. **IRREGULAR OBJECT MOTION:** CAMSHIFT scale its search window to object size and so scales its potential tracking speed with object distance from the camera.
- B. **IMAGE NOISE:** CAMSHIFT's search window help ignores outliers.
- C. **DISTRACTERS:** CAMSHIF ignore object outside its search windows so object such as nearby faces and hands do not affect CAMSHIFT's tracking
- D. **OCCCLUSION:** as long as occlusion isn't 100%, CAMSHIFT will still tend to follow that what is left of the object probability distribution.

Hence, the system does a justice to the proper utilization of the electricity and reduces unnecessary wastage of electricity. It also reduces human efforts. This system can be easily implemented in Malls, Marriage halls, Multiplexes etc. This paper is on **IMPERIUM MANGEMENT** which includes the complete data defining the complete proposed block diagram, algorithm & different paper which favor the aim of the project. Here, we are designing the system for saving the power by making all connections automatic like a fan, light and AC use AVR and a Webcam. Thus reducing the humanitarian efforts and dependency and also helping our environment to conserve electricity. This project can be implemented easily on a large scale in multiplexes, seminar halls etc.

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