Visual Climatic Controller using Embedded System for Power Management

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Abstract - *Due to natural disorder and climatic changes the overhead transmission lines through which power is transmitted is damaged and sometimes it may break the continuity of the transmission lines and floats which in turn forms the other organisms around that place.*

The application of advanced of advanced power interlocking and IoT based in power system protection has been used in this project (Particularly Fuzzy Logic (FL) and several applications to CT and CVT transient's correction).

*Key Words***:** Arduino microcontroller, MATLAB, GLCM parameters, Air conditioner (AC).

1. INTRODUCTION

An AC (Air Conditioner) which was once considered to be a luxury item and was only to be found in big hotels, movie halls, restaurants etc... But, now almost everyone has a AC in our home to beat out the summer/winter and those who have it, worry about one common thing. That is their high electricity consumption and chargers due to it. In this project we are going to make a small Automatic Temperature Control Circuit that could minimize the electricity chargers by varying the AC temperature automatically based on the Rooms temperature. By varying the set temperature periodically, we can avoid making the AC to work for lower temperature values for a long time and thus making it consume less power.

Most of us would have experienced a situation where we have to change the Air Conditioner's set temperature to different values during different times of the day, so as to keep us comfy throughout. To automate this process this project uses a Temperature sensor (DHT11) which reads the present temperature of the room and based on that value it will send commands to the AC through an IR blaster similar to the AC's Remote. The AC will react to these commands as if it is reacting to its Remote and thus adjust the temperature. As your room's temperature changes, the Arduino will also adjust your AC's set temperature to maintain your temperature in just the way you want it to be.

2. WORKING OF AIR CONDITIONER

An air conditioner (AC) in a room or a car works by collecting hot air from a given space, processing it to release cool air into the same space where the hot air had originally been collected. This processing is primarily done using five components:

- Evaporator
- Compressor
- Condenser
- Expansion valve
- Refrigerant

An air conditioner (AC) in a room or a car works by collecting hot air from a given space, processing it within itself with the help of a refrigerant and a bunch of coils and then releasing cool air into the same space where the hot air had originally been collected.

3. AC SENSOR PROCESS

Depends on the availability of peoples present in the room Sensors with be placed in within the air conditioners and sensors will observe the presence of persons and then it will be processed for further executions

4. METHODOLOGY

In the proposed system, a camera is placed near the AC present in the college laboratory. The camera captures the images of the persons present in the laboratory. The captured image is processed in MATLAB and image enhancement is performed in MATLAB. Then statistical analysis (GLCM parameters) is performed for the enhanced image in MATLAB. These statistical values are sent to the Arduino. Based on the statistical values, the Arduino turns relay ON/OFF for AC. The overview of automatic AC control system is shown in figure.
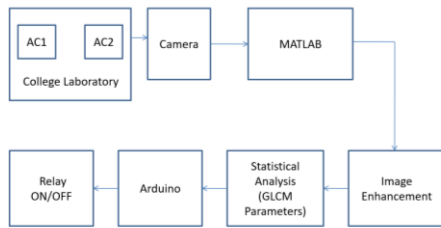
**Fig -1**: The overview of automatic AC control system
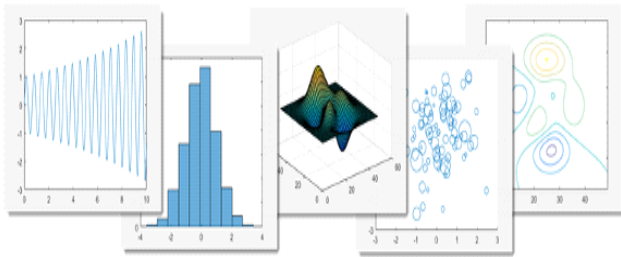
Plot -1: programmatically plotted using graphic functions

Plot continuous, discrete, surface, and volume data. Use plots to visualize data. For example, you can compare sets of data, track changes in data over time, or show data distribution.

Create plots programmatically using graphics functions or interactively using the Plots tab at the top of the MATLAB desktop.

5. RESULT AND ANALYSIS:

The qualitative detection results are shown in the figure including multi-feature combination comparison strategy. It seems that when people enter the room the air conditioner starts running and when the people leave the room the air conditioner turns off.
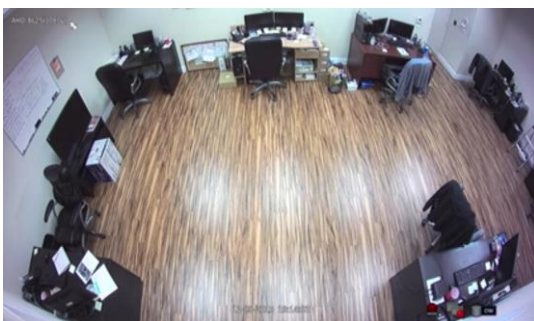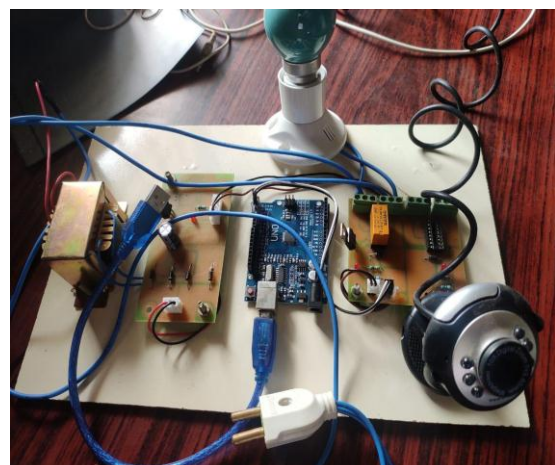

Fig -2: INITIAL IMAGE

Fig -3: COMPARED IMAGE AND AIR CONDITIONER STARTS

Fig -4: AIR CONDITIONER REMAINS OFF

Fig -5: HARDWARE DEVELOPED

6. CONCLUSIONS

This paper discussed about person detection technologies for room air conditioners that use image recognition with the aim of providing both energy efficiency and comfort. Room layout detection detects the size and shape of the room and determines whether doors are open or closed based on in built temperature sensor of AC. The images captured by a camera fitted onto the air conditioner determines the number of people present in the room.

Using the output of image recognition system, the Arduino will automatically control the on and off state of AC to limit power usage. The fine-tuned control of airflow

improves energy efficiency while maintaining comfort by preventing pockets of higher temperature from forming.

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