SOFTWARE REQUIREMENT SPECIFICATION

INTELLIGENT POWER SAVING SYSTEM

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Chapter 1

Introduction

1.1 Purpose

The SRS is a specification for a particular software product, program, or set of programs that performs certain functions in a specific environment. This software requirement specification document provides a complete description of intelligent power saving system.

1.2 Scope

Nowadays, electricity is the one of the important energy in human life. The usage of electricity in this world is increasing because we do not have the awareness of the importance of electricity. This is the reason of the increasing cost of managing, conserving and distributing. The level of electricity usage is high especially at the libraries and lecture halls. Students do not aware that how important for them to reduce the cost of electricity. Thus, this energy saving project will be created. Sometimes we forget to switch off the lighting system and fan. This will increase the waste of electricity. Based on this problem, this energy saving project will be created.

1.3 Definitions,Acronyms & Abbreviations

1.3.1 Abbreviations

- PIR- Passive Infrared Sensor
- LDR- Light Detecting Resister
- LCD- Liquid Crystal Display

1.4 References

- Wikipedia, http://www.wikipedia.org/
- Software Engineering – A Practitoner's Approach, Fifth Edition Roger S Pressman
- Software Engineering, Sixth Edition, Ian Sommerville

1.5 Document Overview

- Section 1 is an introductory chapter which explains the purpose of the project,scope and references.
- Section 2 contains the overall description of the product including the product perspective.
- Section 3 describes various functional requirements that are the product should have.
- Section 4 describes the non-functional requirements of the product.

Chapter 2

The overall Description

2.1 Product Perspective

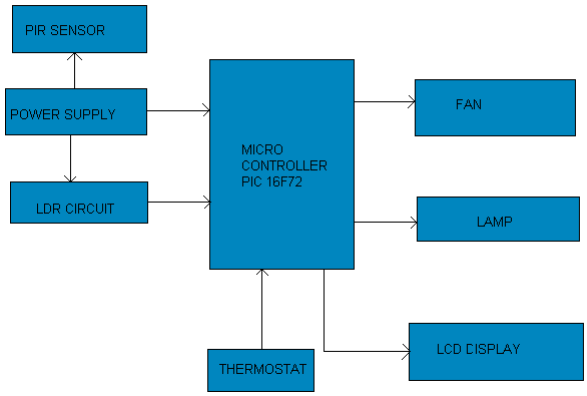

Figure 2.1: product Perspective

If a person entering to the monitored area, the PIR sensors activates and sense the person, gives to the micro controller. The Infrared energy emitted from the living body is focused by a Fresnel lens segment. Then only the PIR sensor activates. After sensing the person LDR checks the light intensity of the monitored area, whether it is bright or dark. Depending on the LDR output, the lamp may be ON / OFF by using Dimmer circuit.

By using this system we can adjust the speed of Fan according to the room temperature measured by Thermostat, which is connected to the micro controller.

To display the room temperature of PIR mode operation we are using the LCD display.

2.1.1 system interfaces

LCD dispaly:To display system state and temperature.

2.1.2 Hardware interfaces

1.PIR Senser
Working: A PIR detector is a motion detector that senses the heat emitted by a living body. These are often fitted to security lights so that they will switch on automatically if approached. They are very effective in enhancing home security systems.
The sensor is passive because, instead of emitting a beam of light or microwave energy that must be interrupted by a passing person in order to "sense" that person, the PIR is simply sensitive to the infrared energy emitted by every living thing. When an intruder walks into the detector's field of vision, the detector "sees" a sharp increase in infrared energy.

2.Thermostat
Working: In this project we are making use DS 1621 thermostat, it's a non-contact digital type temperature transducer suitable for measuring room temperature. The word 'thermistor' is an acronym for thermal resistor, i.e., a temperature sensitive resistor. It is used to detect very small changes in temperature. The variation in temperature is reflected through appreciable variation of the resistance of the device.

3.LDR
Working: LDR's or Light Dependent Resistors are very useful especially in light/dark sensor circuits. These help in automatically switching ON /OFF the street lights and etc., normally the resistance of an LDR is very high, sometimes as very high as 1000000 ohms, but when they are illuminated with light, resistance drop dramatically. Electronic opto sensors are the devices that alter their electrical characteristics, in the presence of visible or invisible light. The best-known devices of these types are the light dependent resistor (LDR), the photo diode and the phototransistors.

2.1.3 User interfaces

1.PIR Senser- It senses the heat emitted by a living body.
2.LCD Dispaly- To display system state and temperature.

2.1.4 Communication interfaces

1.Microcontroller- controls the all system communications.

2.2 Product Functionalities

- Senses the entry of a person in the monitered area.

- Measures the intensity of light in the area.
- Switch ON/OFF the light.
- Measures temperature.
- Controls the speed of fan.
- Deactivtes the senser after the person leaving the palce.

2.3 User Characteristics

The user of the system supposed not to have any knowledge about the system. The system works entirely without the assisstance of the user.

2.4 Design and Implementation Constraints

- The monitered area should be of 10*10m.
- System should be placed inside the monitered area.
- Human blackbody radiation should be focused.

2.5 Assumptions And Dependencies

- The human should enter the monitered area for the system to be active.
- No other living being shouldnot have the same frequency of blackbody radiation as that of human beings'.

Chapter 3

Specific Requirements

3.1 External Inteface

- We need a LCD display to display the room temperature of PIR mode operation.
- A PIR sensor is needed to detect the heat emitted by a living body.
- A Thermostat, is needed for measuring room temperature.
- A LDR is needed to check the intensity in the room.
- A bulb and a fan.

3.2 Functional Requirements

Here we capture the intended behaviour of the system. This behavior can be expressed as tasks, functions and services the system is required to perform.

- Sense the entry of a person in the monitered area: We use a PIR senser to sense the presence of a human being. PIR senser with the help of Fresnel lens senses the human body's black body radiation.The entry of a human being activates the entire system.
- Measure the intensity of light in the area: We measure the intensity of light using a LDR. According to the output of LDR, the system control the intensity of the bulb.
- Switch ON/OFF the light: The bulb is switched ON/OFF according to the intensity of light in the room after the entry of thr person.
- Measure temperature: We measure the temperature using a thermostat, according to the output of which the speed of the fan is adjusted.

- Deactivtes the senser after the person leaving the palce: The whole system should be deactivated when the person moves out of the moniterd area. This is done by the PIR sensor. When the intensity of the blackbody radiation decreases, the PIR sensor detects it and deactivates the entire system.

3.3 Behaviour Requirements

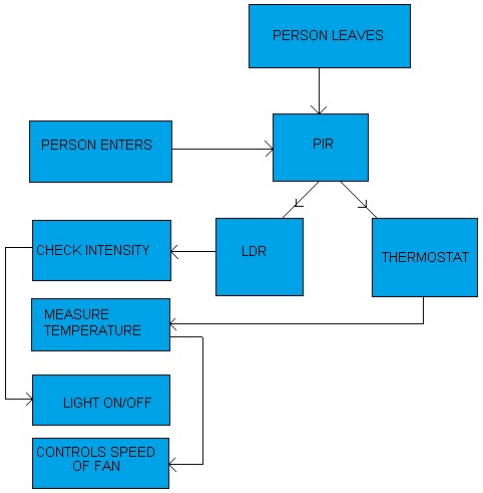

Figure 3.1: Behaviour Diagram

Chapter 4

Other Non Functional Requirements

4.1 Performance Requirements

- Accuracy : The application should be accurate with its output. The algorithms which are to be used should adhere to required accuracy constraints
- Ease of use :The application should be user friendly so that any user can assemble easily.
- Speed : The speed of response by PIR sensor is a major concern.

4.2 Software Quality Requirements

- Availability :The items required for the system is easily available in market. And can be installed without any difficulties.
- Reliability : The PIR sensor should be placed within the range, where the human presence can be detected.
- Expected product life span : Since DC current is using, there will not be any fluctuation. Hence high life span can expected.
- Testability : The system should be properly tested in order to assure its reliability.

Chapter 5

Conclusion

A Software Requirements Specification (SRS) is a complete description of the behavior of a system to be developed. We have included a set of use cases that describe all the interactions the users will have with the software.It also consist of functional and non-functional requirements. Through this document we have understood the specification under various disciplines.