

CHAPTER 1

INTRODUCTION

1.1 Background

This chapter explains briefly about home/lecture hall automation and its operation. This chapter also explains the overview of project objectives, scopes and thesis outline.

1.2 Overview of Home/Lecture Hall Automation Project

Home automation (also called domotics) is a field within building automation, specializing in the specific automation requirements of private homes and in the application of automation techniques for the comfort and security of its residents. Although many techniques used in building automation (such as light and climate control, control of doors and window shutters, security and surveillance systems, etc.) are also used in home automation, additional functions in home automation can include the control of multi-media home entertainment systems, automatic plant

watering and pet feeding, automatic scenes for dinners and parties, and a more user-friendly control interface.

When home automation is installed during construction of a new home, usually control wires are added before the interior walls are installed. These control wires run to a controller, which will then control the environment.

System

The elements of a domotics system are:

- controllers
- sensors
- actuators

Architecture

From the point of view of where the intelligence of the domotic system resides, there are three different architectures:

Centralized Architecture: a centralized controller receives information of multiple sensors and, once processed, generates the opportune orders for the actuators.

Distributed Architecture: all the intelligence of the system is distributed by all the modules that are sensors or actuators. Usually it is typical of the systems of wiring in bus.

Mixed Architecture: systems with decentralized architecture as far as which they have several small devices able to acquire and to process the information of multiple sensors and to transmit them to the rest of devices distributed by the house.

Motion detection is the action of sensing physical movement in a given area. Motion can be detected by measuring change in speed or vector of an object or objects

in the field of view. This can be achieved either by mechanical devices that physically interact with the field or by electronic devices that quantifies and measures changes in the given environment.

Mechanical devices

A tripwire is a simple form of motion detection. If a moving objects steps into the tripwire's field of view then a simple sound device like bells may alert the user. A glass filled to the brim so that surface tension causes a convex meniscus can be placed on top of an object to detect if the object has moved.

Mechanical motion detection devices can be simple to implement, but at the same time, they can be defeated easily by interrupting the devices' mechanics (by "cutting the wire" or "drinking the water"). Electronic motion sensing devices, such as motion detectors, can prevent such mechanical intervention.

Electronic devices

The principal methods by which motion can be electronically identified are optical detection and acoustical detection. Infrared light or laser technology may be used for optical detection. Motion detection devices, such as motion detectors, have sensors that detect movement and send a signal to a sound device that produces an alarm or switch on an image recording device. There are motion detectors which employ cameras connected to a computer which stores and manages captured images to be viewed later or viewed over a computer network.