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A COMPLETE AUTOMATION OF PUBLIC RECREATION GROUNDS WITH CELLULAR DATA TRANSMISSION

Aileen Sonia Dhas.P[1], Aquiline Lydia .L[2] , Sowmiya .A[3] , Karthika .G[4] ,Ashwin.K[5]

[1,2,3,4]Assistant Professor, Electronics and Instrumentation Engineering, R.M.D Engineering College, Thiruvallur , Tamil Nadu

[5] UG - Electronics and Instrumentation Engineering, R.M.D Engineering College,Thiruvallur , Tamil Nadu

Abstract: Automation rules the world nowadays. It is a technique of using computers or mobile phones in monitoring and controlling the simple parameters of day-to-day life. The important aspect of this prototype is cost saving and reduced manpower in recreation grounds. In this project we propose a complete automation system for recreation grounds which needs human interaction in daily scenarios. Our advanced design consists of three sections such as Automatic entrance door opening and closing system, motorized plant watering system and also an energy saving module with LDR sensor. All these activities are uploaded to IOT along with their values for future needs. In this paper, air pollution around the recreational ground is also reported.

Keywords: Automation , IOT ,LDR.

1 . INTRODUCTION

India is gradually inching closer towards its dream of having world-class smart cities.Some of the major components of smart city's major infrastructure are strong IT connectivity and digitization, e-governance and civil partnership, security and security of citizens. Information technology is the cornerstone of all the services offered to the people. The main feature in a smart city would include sustainable environment. In this paper, by complete automation of public recreational grounds, sustainable environment will be achieved .

Sensors are used to collect, compile and integrate real-time data of electricity, gas, water, traffic and other government analysts in a smart grid, which is to be fed into computers.With the availability of 'real-time data', computers can ensure almost full operation .Common concerns are the selection of appropriate sensors based on size, weight, cost, reliability, accuracy, longevity, environmental robustness and frequency response. Invariably sensor data must be recorded, transmitted or displayed. Recording rates and capacities vary enormously.

Devices and objects with built in sensors are connected to an Internet of Things platform, which integrates data from the different devices and applies analytics to share the most valuable information with applications built to address specific needs. An IoT ecosystem consists of web-enabled smart devices that use embedded systems, such as processors, sensors and communication hardware, to collect, send and act on data they acquire from their environments. IOT devices share the sensor data they collect by connecting to an IOT Gateway or other edge device where data is either sent to the cloud to be analyzed or analyzed locally. Sometimes, these devices communicate with other related devices and act on the information they get from one another. The devices do most of the work without human intervention, although people.

2. SYSTEM ANALYSIS

A. EXISTING SYSTEM

All recreation grounds in the cities are operated manually with the help of garden caretakers. The most important problem faced in the existing method is misuse of electricity and its wastage. This happens due to the carelessness of the caretakers allotted in recreation grounds. Sometimes lamps are left ON for a long time even after the garden is closed. It results in wastage of electricity. wasting water is another problem that has to be dealt. The person who is taking care of the ground may not water the plants in a proper manner which causes wastage of water.

B. PROPOSED SYSTEM

The objective of this project is to develop and implement an automated recreation ground system that can be scaled down to improve the conditions of gardens and completely automated grounds. This design also automates the entrance door opening according to the time allotment set in the micro controller with the help of Arduino. Real time data will be collected by employing several analog sensors, such as LDR sensor, air quality sensor and soil moisture sensors.

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Automated lighting systems are activated, if they present insufficient light source which is sensed by the LDR sensor. Thus, this system saves electricity. In addition we also have motorized watering of plants by sensing the moisture present in the soil. Air quality sensor present in the proposed design will monitor the surrounding air quality. In addition we also have IOT where all the sensor data is uploaded and can be used for future need. Here we also have an automatic irrigation system which is used by soil moisture sensor and water pump motor. The soil moisture is dipped in the ground for continuous monitoring of soil moisture and depending upon the dry and wet conditions of soil the water pump motor is turned ON and OFF for a particular time. These are the steps involved in the recreation ground automation. In addition we also have IOT where all the sensor data is uploaded and can be used for future need.

3.BLOCKDIAGRAM

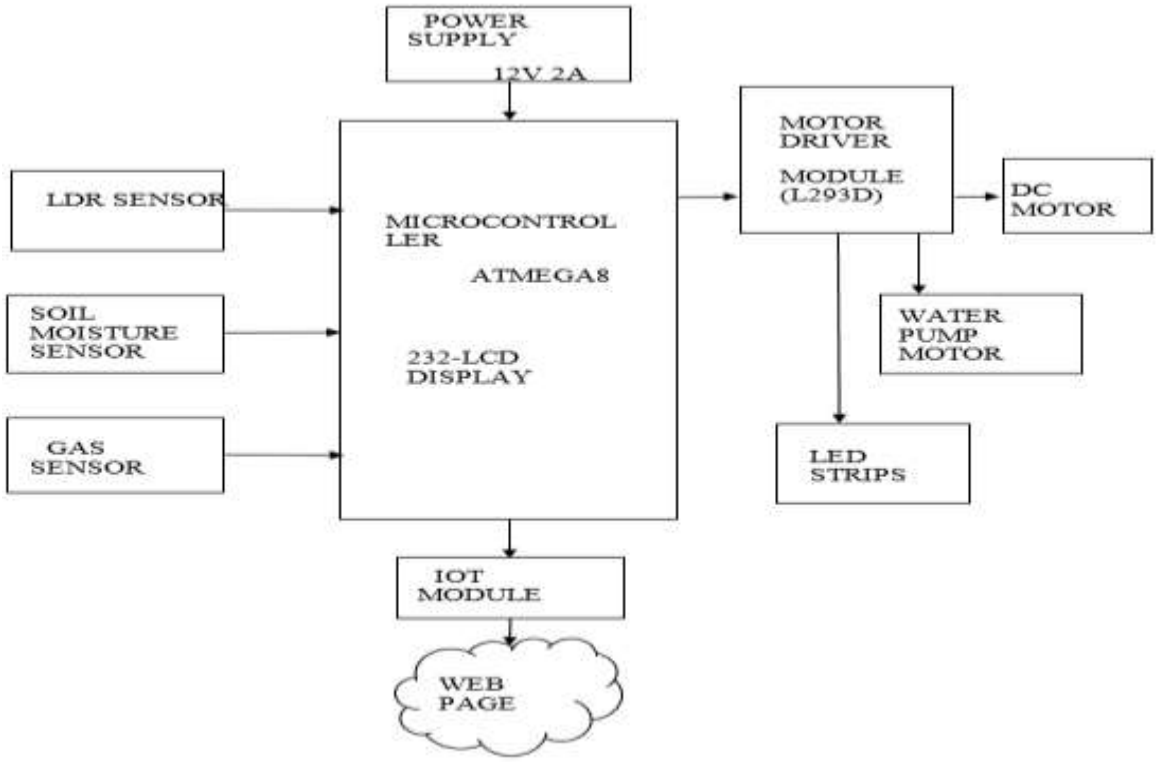

Figure 1 Block Diagram

It consists of a transmitter section and a receiver section. The transmitter section consists of LDR sensor, soil moisture sensor, Air quality sensor, power supply unit and a Microcontroller. The receiver section consists of the Motor driver module (L293D), DC motor, Water pump motor and LED Strips.

The potential transformer will step down the power supply voltage (0-230V) to (0-6V) level. Then the secondary of the potential transformer will be connected to the precision rectifier, which is constructed with the help of op–amp. The advantages of using a precision rectifier are it will give peak voltage output as DC, rest of the circuits will give only RMS output.

Light dependent resistors, LDRs or photo resistors are often used in electronic circuit designs where it is necessary to detect the presence or the level of light. Although other electronic components such as photodiodes or photo-transistors can also be used, LDRs or photo-resistors are particularly convenient to use in LCD display .This is a basic 16 character by 2 line Alphanumeric display. Black text on Green background. Utilizes the extremely common HD44780 parallel interface chipset. Interface code is freely available. Minimum 6 general I/O pins are needed to interface to this LCD screen. Includes LED backlight.

ESP8266 Serial Wifi Wireless Transceiver Module is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. ESP8266 Serial Wifi Wireless Transceiver Module is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor.

Soil moisture sensor can be used to test the moisture of soil, when the soil is having water shortage, the module output is at high level, and else the output is at low level. By using this sensor one can automatically water the flower plant, or any other plants requiring automatic watering technique. Module dual output mode, digital output is simple, analog output more accurate. Soil moisture sensors measure the volumetric water content indirectly by using some other property of the soil, such as electrical resistance, dielectric constant, or interaction with neutrons, as a proxy for the moisture content.This sensor mainly utilizes capacitance to gauge the water content of the soil (dielectric permittivity). The working of this

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sensor can be done by inserting this sensor into the earth and the status of the water content in the soil can be reported in the form of a percent. This sensor makes it perfect to execute experiments within science courses like environmental science, agricultural science, biology, soil science, botany, and horticulture.

4 . HARDWARE DESCRIPTION

Arduino is an open-source project that created microcontroller-based kits for building digital devices and interactive objects that can sense and control physical devices. These systems provide sets of digital and analog input/output (I/O) pins that can interface to various expansion boards (termed shields) and other circuits. The boards feature serial communication interfaces, including Universal Serial Bus (USB) on some models, for loading programs from personal computers. For programming the microcontrollers, the Arduino project provides an integrated development environment (IDE) based on a programming language named Processing, which also supports the languages C and C++.

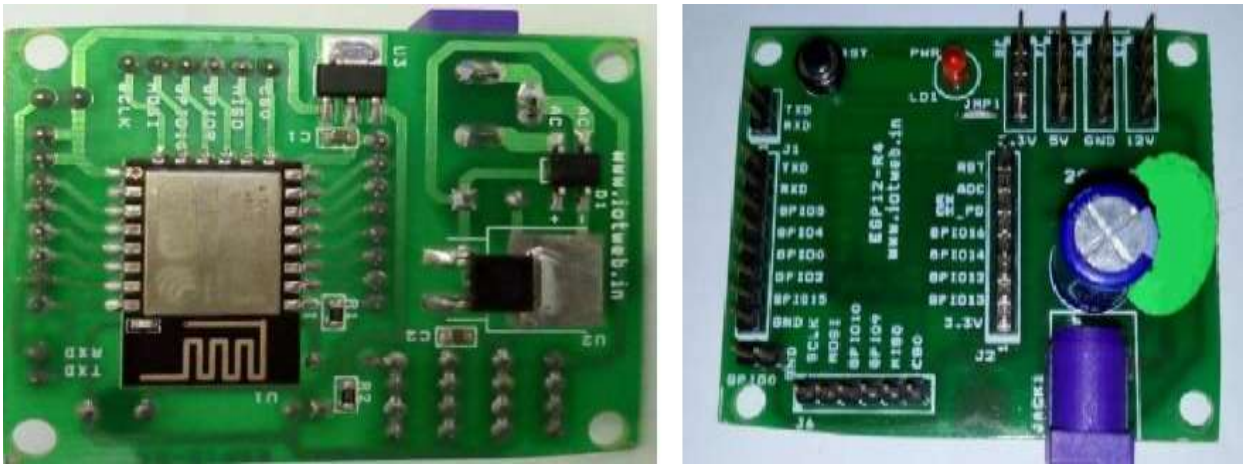

Figure 2: IOT MODULE.

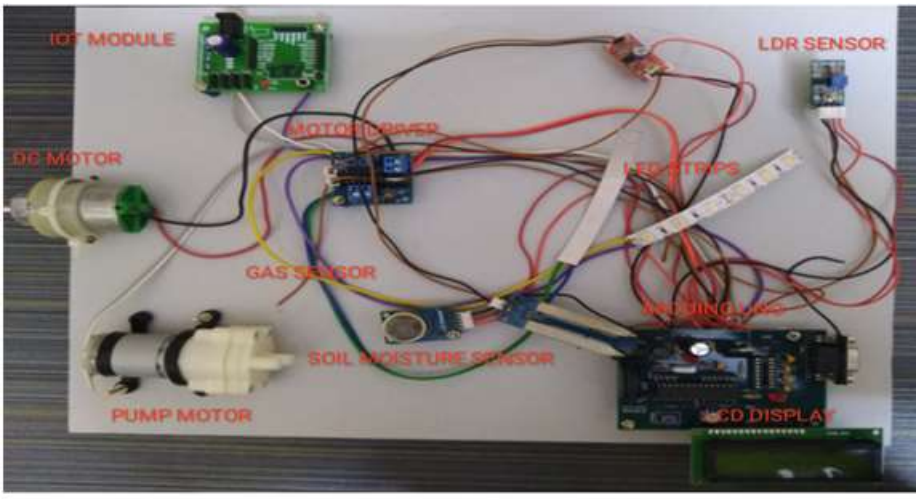

Fig.3. Hardware Setup

5. SOFTWARE DESCRIPTION

High-level language programming has long been in use for embedded-systems development. However, assembly programming still prevails, particularly for digital-signal processor (DSP) based systems. The current boot loader burned onto the Arduino UNO is not compatible with ROBOTC. In its current form, you will be able to download the ROBOTC Firmware to the ArduinoUNO, but you will not be able to download any user programs. The reason for this is because there is a bug in the Arduino UNO firmware that does not allow flash write commands to start at anywhere but the beginning of flash memory (0x000000). Because ROBOTC is not able to burn a new bootloader as of today, you will need to use the Arduino's Open Source language with a modified bootloader file to re-burn your bootloader on your

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Arduino UNO boards. The enhanced bootloader is backwards compatible with the original one. That means you'll still be able to program it through the Arduino programming environment as before, in addition to ROBOTC for Arduino.

HARDWARE RESULTS:

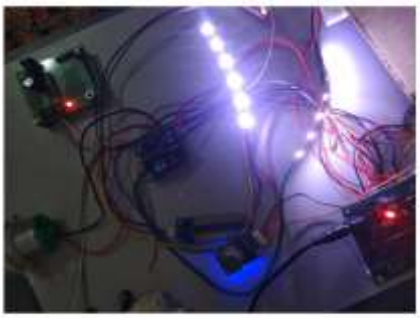

fig: 4 . working of LED strips using LDR sensor in the absence of light

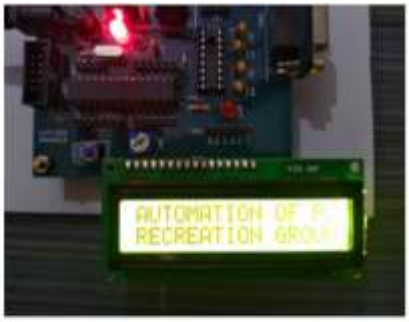

Fig.5 Title being displayed after its turned on

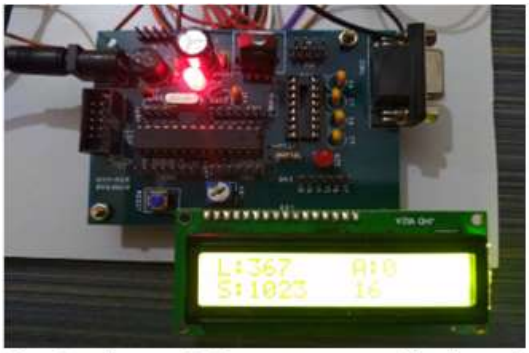

Fig.6 values of the sensor are displayed

CONCLUSION:

The project paper proposed an idea of using the latest technology in the recreation ground field to emphasize the need to implement to reap the benefits of becoming a smart city. The advantages like water-saving and labor-saving, sustainable environment are initiated using sensors that employ automation automatically as they're programmed.

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