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ELECTRONICS

SMARTCANE- A VOICE BASED NAVIGATON FOR VISUALLY IMPAIRED

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ABSTRACT
It is very difficult for the partially or fully blind people to move from one place to another. There is a great chance of accident when nobody assists them. A smart cane with appropriate sensors can be used to solve this kind of difficulty. The electronic system consists of set of sensors, Global Positioning System, GSM module and an LDR with torch light.. Proximity sensors in the cane identify the steps in front .Infrared sensors are used to sense pits. Moisture sensors are fixed at the foot of the cane for avoiding spills. The cane is of light weight. Also low power consumption is its main highlight.

Introduction

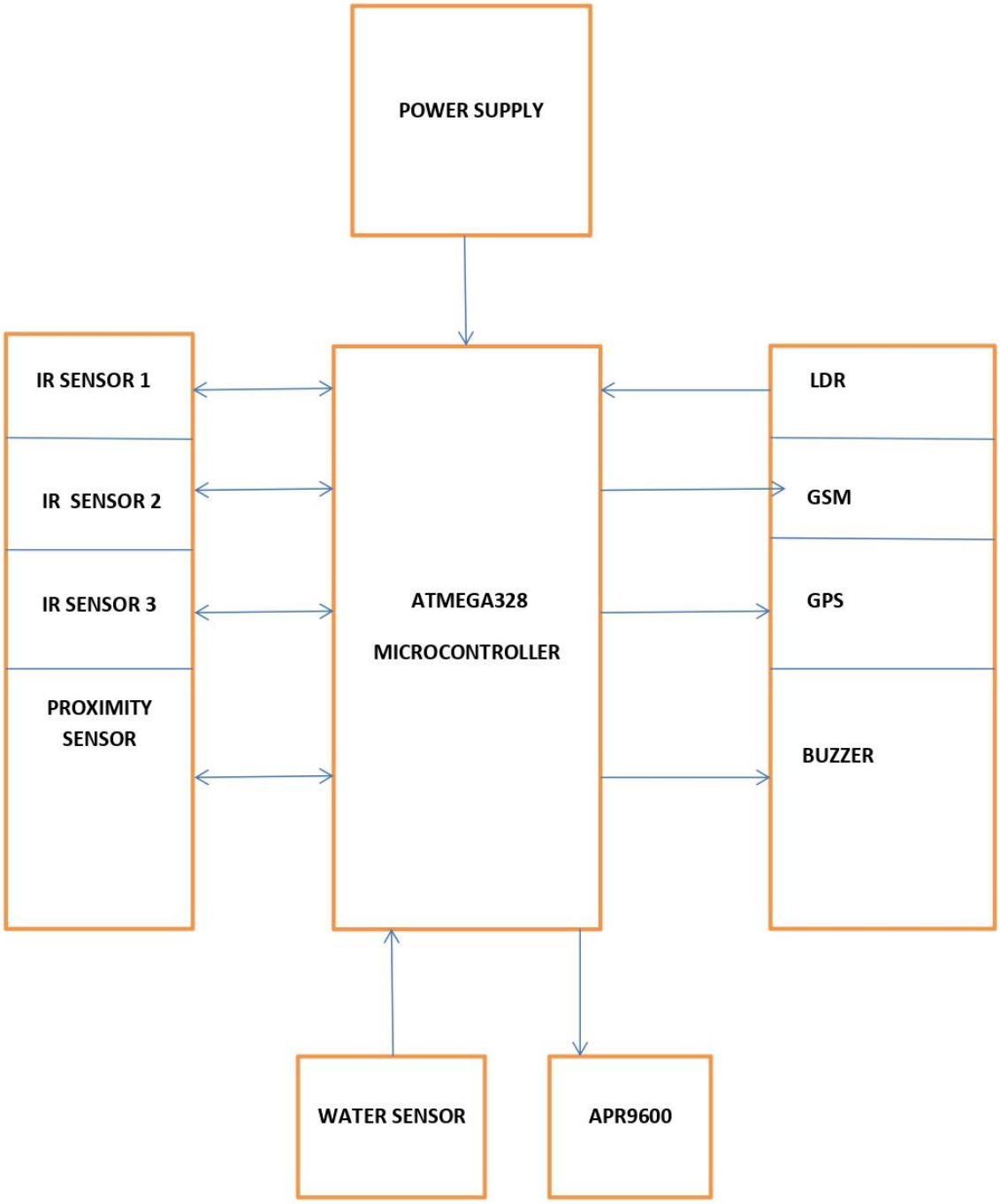
There are different types of smartcanes namely Long Cane, Guide Cane, Identification cane, Support Cane and Kiddie Cane. Height of long cane is adjusted so that it matches with that of person's height.. A guide cane has a height up to waist of user. It identifies staircase steps as well as barriers in front of him. An identification cane gives an indication to others that a blind person is nearby. Support cane gives firmness to blind. Finally Kiddie cane is used by blind children. There is one more device called Miniguide which helps the people in several ways. Eg protection from bus, tall street lights, traffic posts etc. while they walk.

Objectives

The main purpose of the project is to design a smart walking stick for a blind person so that he can go anywhere without other's help. The person can move from place to place freely and confidently. The system consists of sensor assembly, Arduino board and voice play back board.

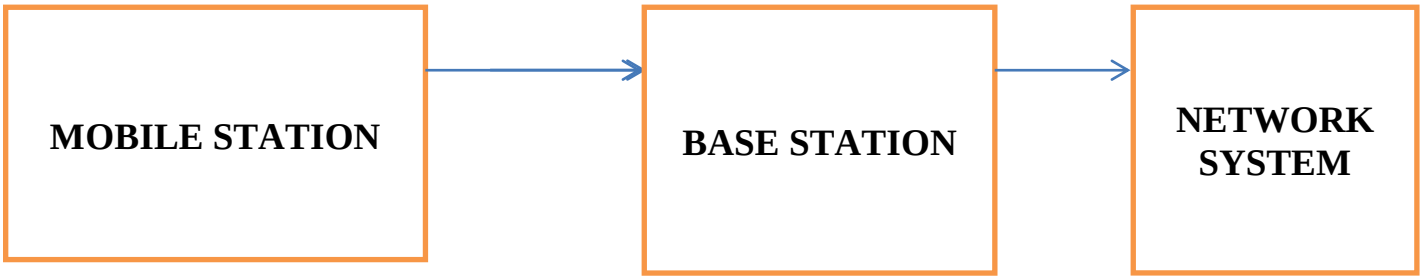
Methodology

The following block diagram explains the working of the system. Block diagram consists of Power supply, three IR sensors, Proximity sensor, Water sensor, Sound record IC, LDR,GSM, GPS, Buzzer and Microcontroller.


POWER SUPPLY
IR SENSOR 1
IR SENSOR 2
IR SENSOR 3
PROXIMITY SENSOR
ATMEGA328
MICROCONTROLLER
LDR
GSM
GPS
BUZZER
WATER SENSOR
APR9600

APR9600 is an IC used for sound recording .Recording is done in both serial and parallel ode.Sound output from microphone is fed to a pre amplifier and level of sound signal is measured. A non volatile RAM stores analog voltage. The diagram of a GSM system associated with the module is given below.

GSM System



Sensors Used

PROXIMITY SENSOR	Used to detect nearby obstacles
IR SENSOR	Provide flexibility of sensing light.
MOISTURE SENSOR	Detects humidity, temperature etc

LDR

An LDR is a Light Dependent Resistor.When LDR faces light, circuit resistance reduces. It is used to check presence of light.

Result

The above designed system helps the blind people to a great extent. Sensor assembly, GSM system, Arduino Board together forms a circuitry and gives best performance.The system has many advantages. The system uses less power,greater reliability and portable also.Automatic barrier detetion and alarming provides more safety.

Conclusion

The smartcane system provides a good security as well as confidence to visually impaired people.For a better performance, the range of infrared sensors system can be improved. If suitable GSM system is also used, best performance can be obtained and the person can walk anywhere without fear.

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