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# Automatic Intelligent Plant Irrigation System Using Raspberry PI and ATMEGA 328

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***ABSTARCT:***

***Irrigation system in India has given a high priority in economic development. Many new concepts are being developed to allow agricultural automation to flourish and deliver its full potential. To take full advantage of these technologies, we should not just consider the implication of developing a new single technology but should look at the wider issues for complete development of a system.***

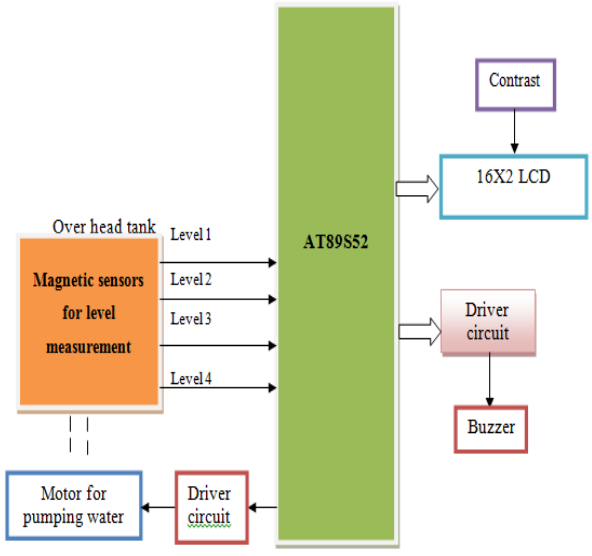
***The project irrigation control using Raspberry pi system based is designed to tackle the problems of agricultural sector regarding irrigation system with available water resources. Prolonged periods of dry climatic conditions due to fluctuation in annual precipitation, may appreciably reduce the yield of the cultivation. The expenses in establishing many of these crops and their relative intolerance to drought make an effective irrigation system a necessity for profitable enterprises.***

## INTRODUCTION

In our daily life we use water for many purposes and in some cases wastage will be done to avoid that this project is very helpful. If a system is developed for automation of pump for filling the container or tank, no operator is required for supervising the system. Automatic water level controllers is the main concept involved here.

## Existing system

This project is specially designed for household, Industries. Magnetic sensors / Reed switches are used as level sensors. The level of the water is monitored by the microcontroller and displayed on LCD. Here a buzzer alert will be given when ever the water reaches extreme low / high levels. A water pump is also connected to the controller to switch on/off the motor automatically when ever required.



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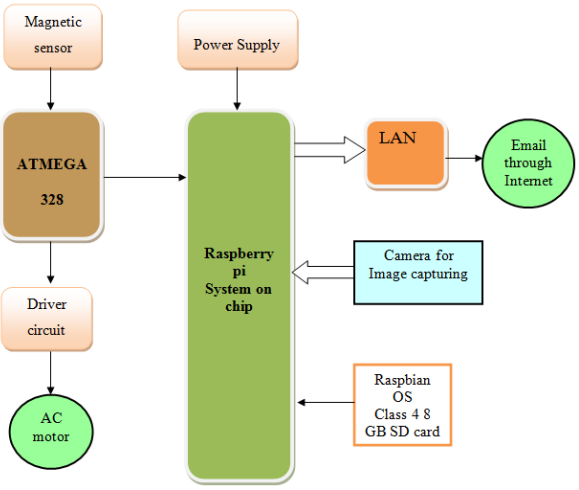
**Draw back:** There is no live monitoring from remote place

## Proposed system

Low-cost and energy efficient drip irrigation system serves as a proof of concept. The design can be used in big agriculture fields as well as in small gardens. The use of magnetic sensors and AC submersible motor make a smart drip irrigation system. Here we are employing an ATMEGA328 as our controller to know the level of water in a tank using magnetic sensors and accordingly the motor can be switched on/off depending on the water level. Raspberry pi is also used to capture the image and forward through E-mail. So that owner can have a glance about their farm/garden.

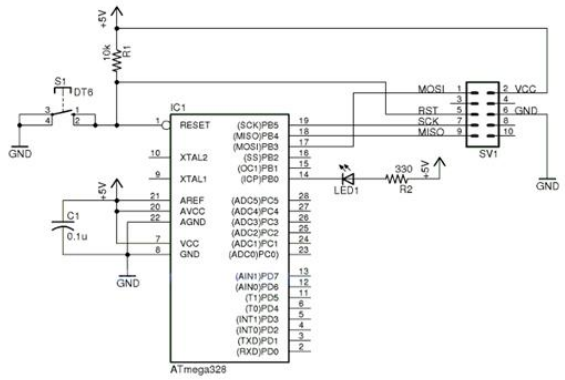
The Raspberry Pi is a credit-card-sized single-board computer developed in the UK by the Raspberry Pi Foundation. The Raspberry Pi has a Broadcom BCM2836/2837 system on a chip. It does not include a built-in hard disk or solid-state drive, but Uses an SD card for booting and long-term storage.

**Block Diagram**




## ATMEGA328

The high-performance Atmel 8-bit AVR RISC-based microcontroller combines 32KB ISP flash memory with read-while-write capabilities, 1KB EEPROM, 2KB SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, 6-channel 10-bit A/D converter (8-channels in TQFP and QFN/MLF packages), programmable watchdog timer with internal oscillator, and five software selectable power saving modes. The device operates between 1.8-5.5 volts.




## RASPBERRY-PI

The **Raspberry Pi** has a Broadcom **BCM2836** system on a chip (SoC), which includes an a quad-core Cortex-A7 cluster. The Cortex-A7 MP Core processor is a high-performance, low-power processor that implements the ARMv7-A architecture. The Cortex-A7 MPCore processor has one to four processors in a single multiprocessor device with a

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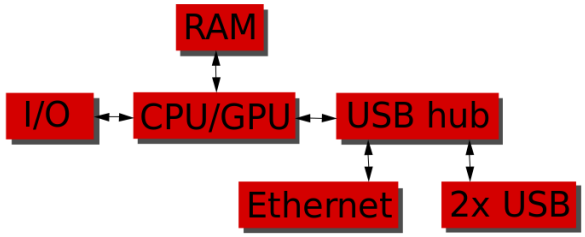
L1 cache subsystem, an optional integrated GIC, and an optional L2 cache controller.

The Raspberry Pi foundation has finally released an upgraded version of the Raspberry Pi. Raspberry Pi 2 model B features much of the same ports and form factor as Raspberry Pi Model B+, by replaces Broadcom BCM2835 ARM11 processor @ 700 MHz with a much faster Broadcom BCM2836 quad core ARMv7 processor @ 900 MHz, and with an upgrade to 1GB RAM.

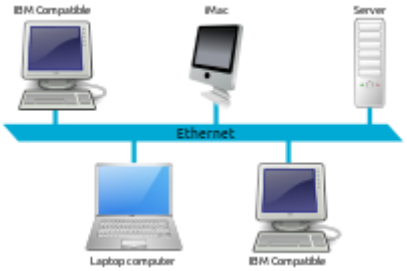
### Basic Hardware of Raspberry-PI




### LAN

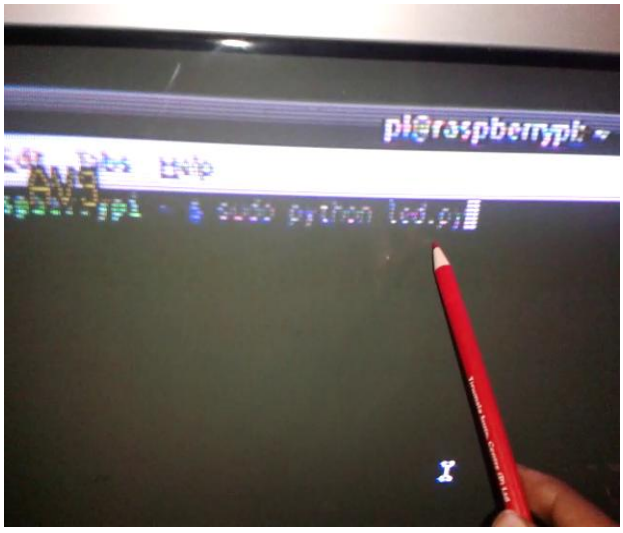
A local area network (LAN) is a computer network that interconnects computers within a limited area such as a home, school, computer laboratory, or office building, using network media. The defining characteristics of LANs, in contrast to wide area networks (WANs), include their smaller geographic area, and non-inclusion of leased telecommunication lines.

ARCNET, Token Ring and other technology standards have been used in the past, but Ethernet over twisted pair cabling, and Wi-Fi are the two most common technologies currently used to build LANs.




### OS used in Raspberry pi is Linux


### Coding will be done in C/python language




### Advantages

- Highly-flexible
- Fit & Forget System
- No need of human effort
- High security is provided

### CONCLUSION

This project presents a high sensitive sensors based automotive device control. The tracking controller based on the closed loop algorithm is designed and implemented with MCU in embedded system domain.

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