AUTOMATIC FISH FOOD FEEDING SYSTEM

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ABSTRACT

This paper deals with the design of smart fish feeder system for the application of pond. An automatic fish feeder is a device/product which provides the right amount of fish food at a predetermined time and it helps the owner to feed their fish when on a vacation or too busy to maintain a regular feeding schedule. It also ensures the fishes are fed in a healthy way and on time. The owner can set the daily feeding time, feeding quantity, number of repetitions with time delay and also other optional limits. It can repeat its task fish farmer on daily basis. Further, the system is smartly monitored for the feed level and details are displayed in the display. The whole process uses electro mechanical feeding and feedback control mechanism with ARDUINO. This mechanism is actuated by relay with gear motor.

Keywords: Aquaculture, Iot (Internet Of Things),Control Systems, Fish Farming, Arduino Uno.

I.   INTRODUCTION

Manual feeding uses the man power which requires the owner's precise quantity of food to avoid the waste of pellet that was supplied to the fish. Meanwhile, it is not practical if the owner goes out of town for many days and leaving the fish without food. There are several problems which had been known through research study on commercial fish feeder available in market and also through research journal. This system is trying to improve the efficiency and reliability of the previous available automatic fish feeder. The amount of fish pellets through manual feeding is in accurate; it could seriously affect fish's health. If the amount of fish fed is small, then there could be severe loss of fish due to starvation. On the other hand, from the required amount, this can cause contaminate

II.   METHODOLOGY

EXISTING METHODOLOGY

In the existing system, manual feeding uses the man power which requires the owner's precise amount of food to avoid the waste of pellet that was supplied to the fish. Meanwhile, it is not practical if the owner goes out of town for many days and leaving the fish without food. The amount of fish pellets during feeding system is the major criteria. The amount of fish pellets through manual feeding is in accurate; it could seriously affect fish's health. If the amount of fish fed is small, then there could be severe loss of fish due to starvation. On the other hand, if the amount exceeded from the required amount, this can cause contaminate the water and clog up important filters in the aquarium. Hence the owner must be able to feed their fish at correct interval time with desired amount.

PROPOSED SYSTEM

The development of Automatic Fish Feeder Intelligent System that could alerts owner through buzzer. The mechanical and electrical part in the system consists of ARDUINO, buzzer, button, and geared motor. The feeder will distribute fish pellets at predetermined time through the RTC & controller. During the predefined time, the controller gives signal to the motor to feed food to the fish at a predefined time. The block diagram of the Automatic Fish feeder system consists of various blocks such as LCD, buzzer, Relay, Button, RTC and motor.

ARDUINO UNO

General 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. The project is based on microcontroller board designs, produced by several vendors, using various microcontrollers. 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++.
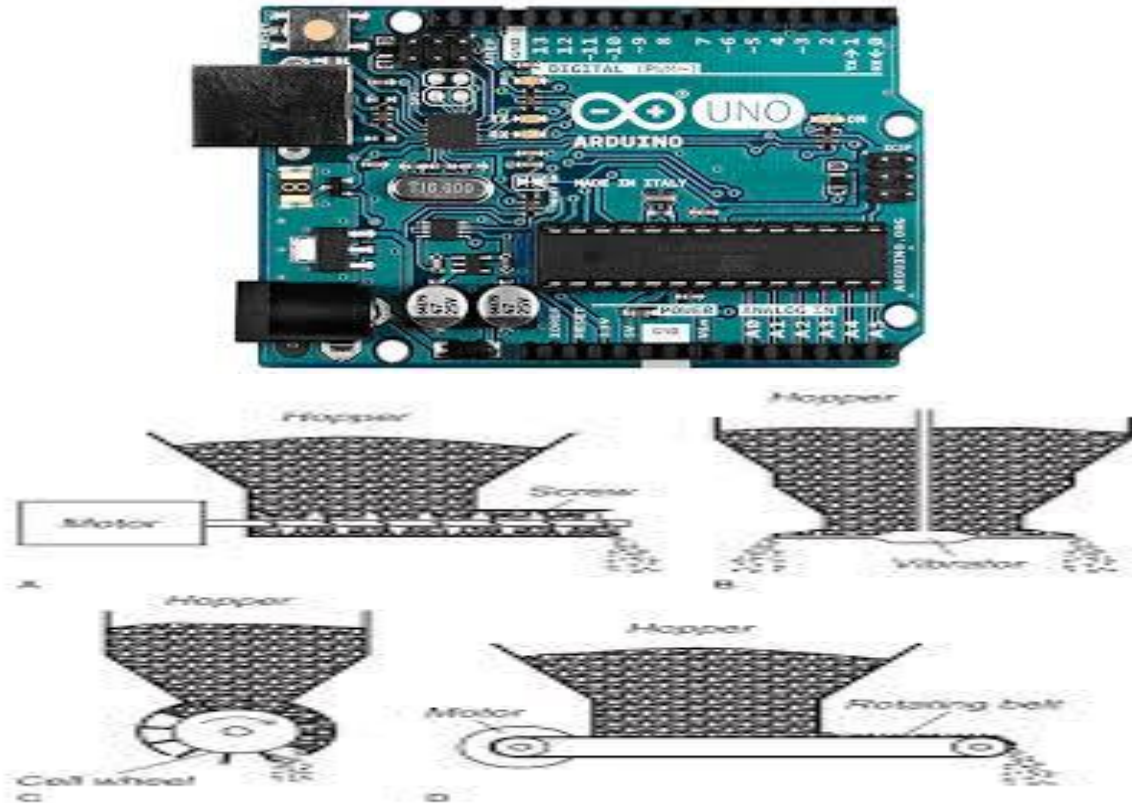

Figure 16.5 Different types of feed distribution mechanisms: (A) screw feeder; (B) vibrating feeder; (C) cell wheel feeder; (D) rotating belt feeder.

PRODUCT DESCRIPTION

Arduino Uno is a microcontroller board based on the ATMEGA 328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with AC-to-DC adapter. Arduino UNO has a number of facilities for communicating with a computer, another Arduino board, or other microcontrollers.

ATMEGA328P-PU microcontroller

The most important element in Arduino UNO R3 is ATMEGA328P-PU is an 8-bit Microcontroller with flash memory reach to 32k bytes. It's features as follow:

High Performance, Low Power AVR

Advanced RISC Architecture

1 Powerful Instructions – Most Single Clock Cycle Execution

32 x 8 General Purpose Working Registers

Up to 20 MIPS Throughput at 20 MHz

On-chip 2-cycle Multiplier

High Endurance Non-volatile Memory Segments

4/8/16/32K Bytes of In-System Self-Programmable Flash program memory

256/512/512/1K Bytes EEPROM

512/1K/1K/2K Bytes Internal SRAM

Wtite/Erase Cycles: 10,000 Flash/100,000 EEPROM

Data retention: 20 years at 85°C/100 years at 25°C

Optional Boot Code Section with Independent Lock Bits

In-System Programming by On-chip Boot Program

True Read-While-Write Operation

Programming Lock for Software Security

Two 8-bit Timer/Counters with Separate Prescaler and Compare Mode

One 16-bit Timer/Counter with Separate Prescaler, Compare Mode, and Capture Mode

Real Time Counter with Separate Oscillator

Six PWM Channels

8-channel 10-bit ADC in TQFP and QFN/MLF package

Temperature Measurement

6-channel 10-bit ADC in PDIP Package

Temperature Measurement

Programmable Serial USART

Master/Slave SPI Serial Interface

Byte-oriented 2-wire Serial Interface (Philips I2 C compatible) Programmable Watchdog Timer with Separate On-chip Oscillator

On-chiAnalog Comparator

Inerrupt and Wake-up on Pin Change

Special Microcontroller Features

Power-on Reset and Programmable Brown-out Detection
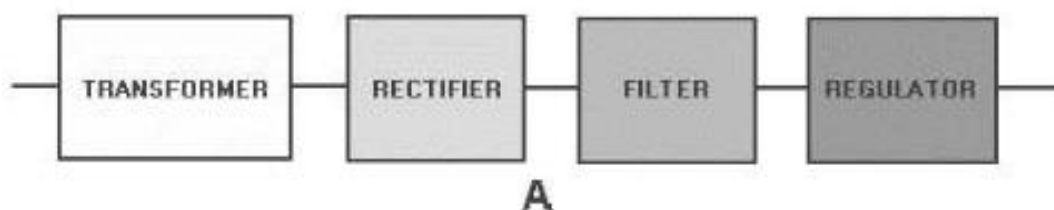
Internal Calibrated Oscillator TV

External and Internal Interrupt Sources

Six Sleep Modes: Idle, ADC Noise Reduction, Power-save, Power-down, Standby, and Extended Standby

I/O and Packages

28 rogrammable I/O Lines

POWER SUPPLY

A

DEFINITION

A power supply (sometimes known as a power supply unit or PSU) is a device or system that supplies electrical or other types of energy to an output load or group of loads. The term is most commonly applied to electrical energy supplies, less often to mechanical ones, and rarely to others

CIRCUIT DESCRIPTION

This circuit is a small +5V power supply, which is useful when experimenting with digital electronics. Small inexpensive wall transformers with variable output voltage are available from any electronics shop and supermarket. Those transformers are easily available, but usually their voltage regulation is very poor, which makes then not very usable for digital circuit experimenter unless a better regulation can be achieved in some way. The following circuit is the answer to the problem.

This circuit can give +5V output at about 150 mA current, but it can be increased to 1 A when good cooling is added to 7805 regulator chip. The circuit has overload and thermal protection.

PRODUCT DESCRIPTION

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

It generates consistent single tone sound by applying D.C voltage. Using a suitably designed resonant system, this type can be used where large sound volumes are needed.
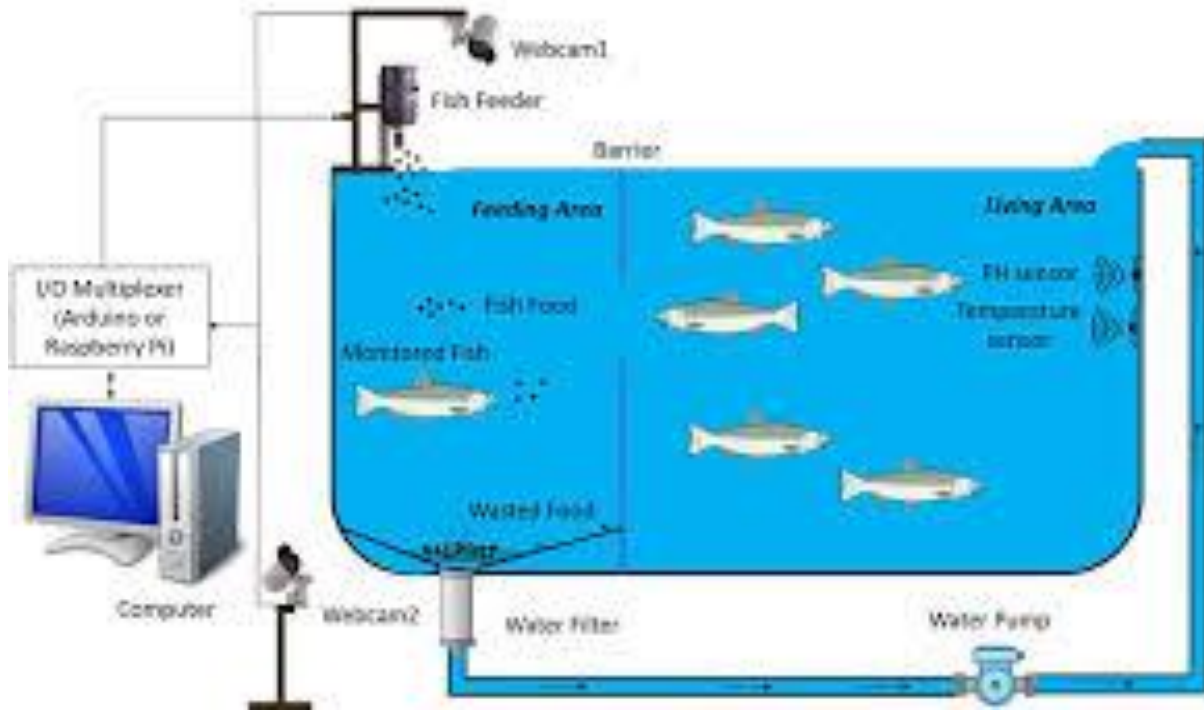
III.   CONCLUSION

In the present world everything is automated to reduce work pressure of human. In this project, we have proposed a new Pond feeding system that can feed the fish while the owners are absent. The proposed system is distinctive in terms of automatic technologies, particularly microcontroller based Embedded Systems with less memory size along with the limit in interfacing peripherals which leads to lag in the deployment of the systems. Therefore, the proposed automated Arduino based Pond Monitoring system that enables RTC sensor and wireless communications. Therefore, the proposed system is not restricted in space and time as it is wireless. However, we think that we can expand the usage of the Smart Pond Feeding System along with the demand of the owners. It also provides efficient Automated Control over the issues.

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