Relating DT Based Food Feeder For Fish Using AI

1st Gokul Prasad C
Assistant Professor
Electronics and Communication Engineering
SNS College of Engineering
Coimbatore, India
gokul.c.ece@snsce.ac.in

2nd Gowtham S
UG Student
Electronics and Communication Engineering
SNS College of Engineering
Coimbatore, India
gowtham.s.ece.2022@snsce.ac.in

3rd Kalaiselvan S
UG Student
Electronics and Communication Engineering
SNS College of Engineering
Coimbatore, India
kalaiselvan.s.ece.2022@snsce.ac.in

4th Libivarma K
UG Student
Electronics and Communication Engineering
SNS College of Engineering
Coimbatore, India
libivarma.k.ece.2022@snsce.ac.in

5th Mathavan R
UG Student
Electronic and Communication Engineering
SNS College of Engineering
Coimbatore, India
mathavan.r.ece.2022@snsce.ac.in

Abstract-Manual feeding uses man power to supply the food to the fish. Meanwhile, it is not practical if the aquarist goes out of town for many days and leaving the fish without food. An AI-based food feeder for fish could incorporate advanced technology to enhance the feeding experience and cater to the specific needs of aquatic pets. Design Thinking is a design methodology that provides a solution-based approach to solving problems. We empathize that a large amount of man power need for fish farm so, we define a solution for that is AI based food feeder for fish .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. An arudino micro-controller has been integrated with the designed mechanical system to controlled the opening and closing of the food chamber door with the help of servo motor. An easy digital LCD programming system allows the user to set the time interval between two successive food deliveries and the number of servo rotation at each delivery to supply their desired amount of food. The performance of this portable and the low-cost feeder has been tested which has shown the reliability to dispense the accurate amount of food .

At the present especially urban people lead a busy life . Being exhausted the discharge of various duties is a daily occurrence there. Thus , to enjoy a little tranquillity or just by mere hobbies ,amide of the hundredth busyness, one may fish in aquarium or may fowl on the porch, while someone may feed cats or other pet animals. However, there is a problem one who forgot to feed his/her pets in time for busyness or goes along vacation .

Keywords: Deisgn Thinking, Arduino UNO, AI, Servo motor, LCD display, RTC module, Keypad.

1.INTRODUCTION

In modern world we need AI based food feeder for fish because we can reduce the man power in larger scale fish farm in the agriculture field. An AI-based food feeder for fish could incorporate advanced technology to enhance the feeding experience and cater to the specific needs of aquatic pets. Implement computer vision to recognize the food feeding time for fish. This allows for personalized feeding, ensuring each fish gets the right amount and type of food. We can use this for the domestic purpose also when we move for a vacation the food feeder automatically feeds the fishes in the tank. It very useful in the aquarium and large scale fish farm to the feed the fish automatically by setting the feeding time of the fish by the timer. This will very helpful the people who have large scale fish productions companies and also very useful in agriculture. Utilize machine learning to analyze the fish's behavior and adapt the feeding schedule accordingly. The feeder can learn and adjust based on the fish's preferences and health requirements.

2.BACKGROUND OF THE STUDY

The purpose of this is about the design and implementation of an automatic feeder to feed fish in aquarium, agricultural field and fish farm when the owner leaves home for a prolongated time or forget to feed timely due to their busyness. It also helps to reduce the man power. The mechanical drawing of the feeder is prepared in Auto Desk Fusion 360 software which is followed by the fabrication in a 3-D printer for automatic feeding . An arudino micro-controller has been integrated with the designed mechanical system to controlled the opening and closing of the food chamber door with the help of servo motor. An easy digital LCD programming system allows the user to set the time interval between two successive food deliveries and the number of servo rotation at each delivery to supply their desired amount of food. The performance of this portable and the low-cost feeder has been tested which has shown the reliability to dispense the accurate amount of food.

3.HARDWARWE USED

Arduino UNO

Since it was first debuted, the Arduino Uno has been a huge hit with electronics enthusiasts from beginner hobbyists to professional programmers. It is an open-source platform, means the boards and software are readily available and anyone can modify and optimize the boards for better functionality. The software used for Arduino devices is called IDE (Integrated Development Environment) which is free to use and required some basic skills to learn it. It can be programmed using C and C++ language..

Fig 1: Arduino UNO

Servomotor

A servo motor is a type of rotary actuator that allows for precise control of angular position. It's commonly used in robotics, automation, and other applications where accurate positioning is crucial. Servo motors typically consist of a motor, a feedback sensor (like an encoder), and a controller. They're designed to provide accurate and controlled movement, often within a specific range of motion.

Fig 2: Servomotor

RTC Module

The DS3231 is an I2C real-time clock (RTC) with an inbuilt temperature compensated crystal oscillator (TCXO) and crystal that is both low-cost and exceptionally precise. When the module's power is interrupted, the device has a battery input and keeps a precise time.The device's long-term precision is improved by the inclusion of the crystal oscillator. The RTC keeps track of seconds, minutes, hours, days, dates, months, and years. For months with less than 31 days, the date at the end of the month is automatically modified, including leap year corrections. The clock has an AM/PM indication and works in either a 24-hour or 12-hour mode.

Fig 3: RTC Module

LCD Display

LCD (Liquid Crystal Display) is a type of flat panel display which uses liquid crystals in its primary form of operation. LEDs have a large and varying set of use cases for consumers and businesses, as they can be commonly found in smartphones, televisions, computer monitors and instrument panels. The way a pixel is controlled is different in each type of display; CRT, LED, LCD and newer types of displays all control pixels differently. In short, LCDs are lit by a backlight, and pixels are switched on and off electronically while using liquid crystals to rotate polarized light. A polarizing glass filter is placed in front and behind all the pixels, the front filter is placed at 90 degrees. In between both filters are the liquid crystals, which can be electronically switched on and off.

Fig 4: LCD Display

4. CIRCUIT DIAGRAM

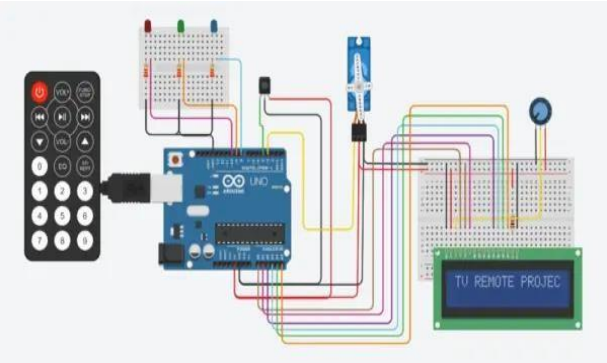

Fig 5A: Symmatic Diagram

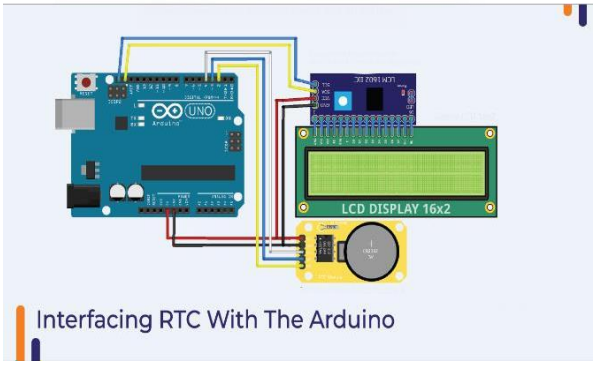

Fig 5B: Symmatic Include- RTC, LCD&Arduino

5.THE WORKING OF THE SYSTEM

An Arduino micro-controller has been integrated with the designed mechanical system to controlled the opening and closing of the food chamber door with the help of servo motor. An easy digital LCD programming system allows the user to set the time interval between two successive food deliveries and the number of servo rotation at each delivery to supply their desired amount of food. The performance of this portable and the low-cost feeder has been tested which has shown the reliability to dispense the accurate amount of food . . We can use this for the domestic purpose also when we move for a feeds the fishes in the tank. It very useful in the aquarium and large scale fish farm to the feed the fish automatically by setting the feeding time of the fish by the timer. This will very helpful the people who have large scale fish productions companies and also very useful in agriculture. The purpose of this is about the design and implementation of an automatic feeder to feed fish in aquarium, agricultural field and fish farm when the owner leaves home for a prolongated time or forget to feed timely due to their busyness. It also helps to reduce the man power. The mechanical drawing of the feeder is prepared in Auto Desk Fusion 360 software which is followed by the fabrication in a 3-D printer for automatic feeding. At the present especially urban people lead a busy life .

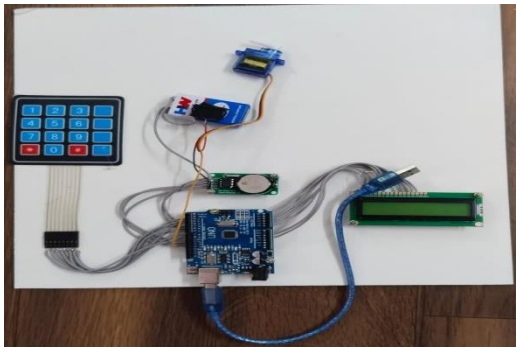

Fig 6 A: First set up the module and then connect the wire properly

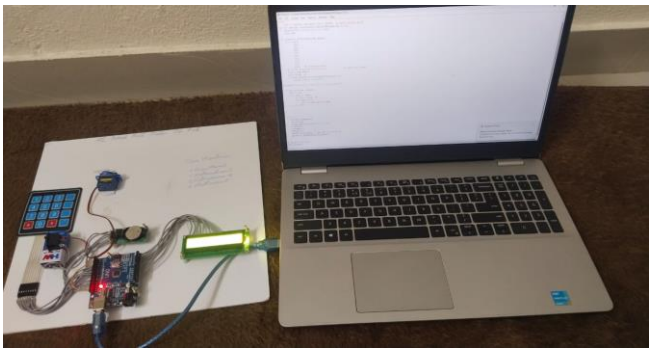

Fig 6 C: In this step using machine learning So, select the python code and run the program.

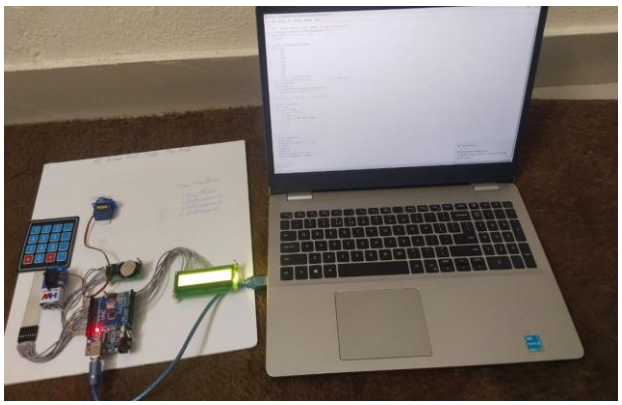

Fig 6 B: And then connect the Arduino uno USB cable Have to insert Pc or Laptop.

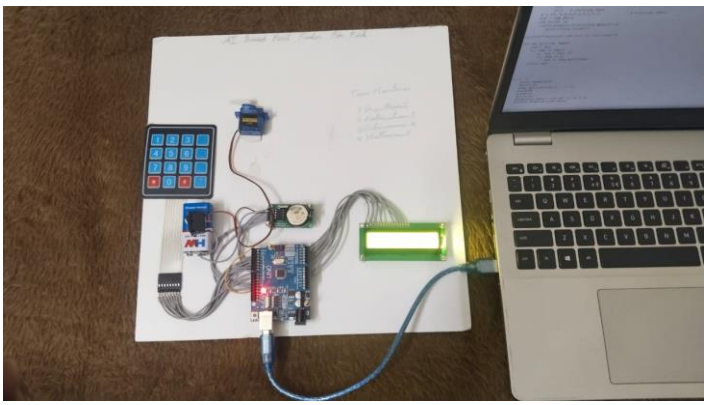

Fig 6 D: Final step set the LCD display On that food as drop connect Time Automatically to fish

6.CONCLUSION

A design is implemented to feed more than one pet of different species. This design is also reduce a man power,low cost and reduce maintences help full for fish farm,aquarium,agriculture on this field the food feeder system demands are very high.The accuracy of the system is high as we are using Digital Image processing.

This design of pet feeder provides few other features which will be more convenient for both owner and pet. This system also provides all information about the feeding of pets like is it getting fed or not, is it getting fed in proper quantity or not that might help to get rid of the overfeeding problem.

7.FUTUREWORK

This technology can also be used with the Home. Automation technologies. It can also be made more advanced such that it can be used with more sensors.

This pet feeder is a must as it will make the lives of the own easy. The owner, absent or present at home will be tension free as the pet feeder will keep the pet fed on time.

REFERENCES

[1]“IntelligentFoodDispenser(IFD)”HariN.Khatavkar,RahulS.Kini,Suyash K. Pandey, Vaibhav V. Gijare, 2019.

[2]“Digital Image Processing-A Quick Review” R.Ravikumar,Dr.V.Arulmozhi,2019.

[3]“A Remote Pet Feeder Control System via MQTT Protocol” Wen-Chuan Wu,Ke- Chung Cheng, PeiYu Lin, 2018.

[4]“Automatic Pet feeder” AasavariKank, Anjali Jakhariye,2018.

[5]“Pet Feeding Dispenser using Arduino and GSM Technology” SmruthiKumar,2018.

[6]“Automatic Pet Monitoring and Feeding System Using IoT” S.Subaashri, M.Sowndarya, D.K.S. Sowmiyalaxmi, S.V.Sivassan, C. Rajasekaran, 2017.

[7]“Remote Controlled and GSM Based Automated Pet Feeder” Prashant Singh, Amit Kumar Sharma, PayalSood, Paramdeep Singh, 2015.

[8]“Automatic Pet Feeder”ManojM,2015.

[9]“Smart Dog Feeder Design Using Wireless Communication”, MQTT and Android Client” Vania, KanisiusKaryono, Hargyo Tri Nugroho,2016.

[10]“Programmable Pet Feeder” TessemaGelilaBerhan, WorkuToyibaAhemed.