

Intelligent fishbowl (ACUAPY)

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I. SUMMARY

In our daily lives we have in mind all kinds of electronic devices that facilitate communications, both with other people and with other electronic devices. On the other hand, nowadays, in a great number of homes there are pets, where the fish stand out, among others. There are many homes in which we find an aquarium. These have the following parameters in the container water that needs to be monitored on a regular basis. These parameters are normally controlled manually, where the presence of one person is necessary. The objective of this project is to reflect the study and implementation of an Electronic Control System for the Aquarium controlling the physical variables involved in a confined environment. For the control of the aquarium a food dispenser was placed, with an ultrasonic sensor where it is going to send an email to the user when it does not have food for the fish, besides a temperature sensor, a pH sensor, which acquire the data provided by the environment, and the system determines if the temperature of the water is lower a water heater is activated and if the temperature is higher turns off the heater, if the pH level is not between 6.5 and 7.5 will send an email to the user indicating that the water should be changed, the information obtained from the sensors is stored on a website, where it is accessed with an email and a password.

II. INTRODUCTION

For a long time people like to have and care for their own and different type of aquarium /terrarium, and wanted to have it, well controlled to avoid problems that can damage the aquarium and thus not have to be totally aware of their care, therefore we have sought to use current technology to be able to personally automate the work of that care, in addition the tasks that are complex to perform now are developed automatically without leaving aside the control you have over that task. And thus to be able to have an intelligent aquarium where it fulfills necessary functions for optimal development of the aquatic fish. The objective of the project is the development of an electronic system that integrates to the Raspberry platform, to be able to monitor and control the necessary information, received by different sensors as the temperature DS18B20 and PH sensor.4] ACUAPY will be in charge of quantifying the data provided by the sensors activating the necessary actuators when it reaches any of the limits defined in the programming, such as turning off the CO2 pump, from the page the user is allowed to activate any of the

actuators if he has not yet reached one of those limits. the user will be able to interact with the Thingspeak page, being able to visualize the sensor data by means of graphs. This project covers fields and tasks to be carried out, from research of graphic environments for Python, to the development of a web application through Flask.[1]

III. GENERAL OBJECTIVE

1. Develop and build, programming an electronic system that incorporates the possibility of transmitting data of the main parameters to be measured in an aquarium to a central unit that stores this information and makes decisions autonomously activating various actuators. The user will be able to consult this information in real time and through the web, in addition to this he will be able to activate or deactivate actuators manually, for example, the game of lights of the aquarium.

IV. SPECIFIC OBJECTIVES

- a) Establish a system of communication between the system and the user through emails and web pages.
- b) Development of the communication code between the Arduino and Raspberry via serial communication.
- c) Study and creation of the Raspberry as a server to create a web application to motorize the aquarium.

V. PROBLEM STATEMENT

2. Finding a suitable way to supply the care of an aquarium. This project is based on the needs of the aquarium owners as well as the difficulty to feed them, since sometimes the owners or the people in charge of these animals do not have time, forget to do it or travel, therefore this project supplements these and other more.

VI. HOW IT WORKS

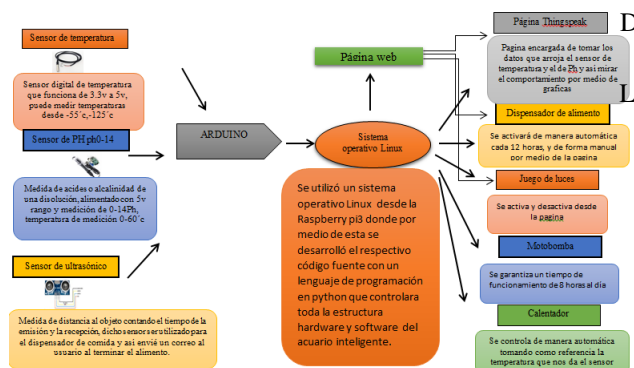
3. The fish tank will operate automatically, regulating the water temperature according to the parameters given by the program, will feed the fish twice a day and will be constantly monitoring the temperature and pH of the water in order to regulate the environment of the fish. In addition, there will be a web page which will allow the user to activate each of the devices in the fish tank, either the heater, the food dispenser and the pump that will cool and oxygenate the water in the fish tank. In each case

there will be a type of regulation (except the Ph) that stabilizes the environment. When the temperature is very low will activate a heater that will turn on for a couple of seconds to return the water to room temperature, if on the contrary the water is very hot, will turn on the pump to cool the water and also if oxygen levels are very low, create water currents that will return O2 levels to normal if there is any irregularity in the environment of the fish tank, an email will be sent to the user to inform him of the problem, either by lack of food or irregular temperatures.[5]

VII. CONCLUSIONS

4. To conclude, this project allows the user to not worry about his fish, since all he has to do is fill the food dispenser when the food has run out.
5. The remaining devices will work and act autonomously or when the staff wants to activate through the page any of the devices implemented in the aquarium.
6. They have achieved the objectives that had been set, managing to expand the project integrating Arduino, Raspberry, to be able to monitor at all times in real time and automate the care of an aquarium can be of any kind because it covers the basic needs of all of them.

VIII. BLOCK DIAGRAM



IX. PROTOTYPE

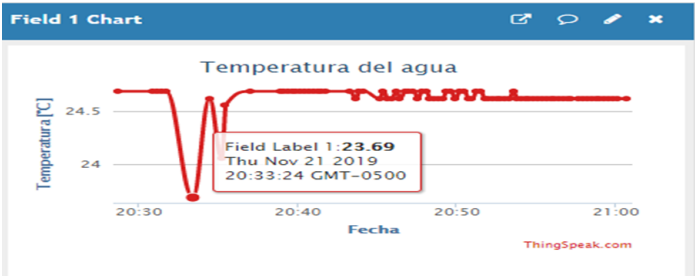


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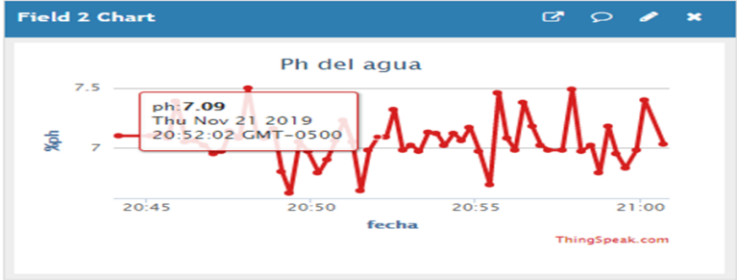
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XI. SENSORS GETTING THE VALUES



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