REMOTE CONTROLLED AND GSM BASED AUTOMATED PET FEEDER

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Abstract- In this paper a new design of pet feeder is proposed which can be controlled by interactive remote controller which helps to get rid of the manual settings of the previous versions of pet feeder. This design contains many new features as compared to the previous versions. In this design user can adjust the feed time, time gap between consecutive feeds and the quantity of feed served. This design also contains the call for pet at feed time, refill alert, dual power supply with battery charger, Massage alert system for owner in case of pet don’t get it’s feed, safety lock for container, sensor based system to serve previously served feed in case of left feed and the priority feeder with dual option of serve as by owner can opt for multi time and pet can opt for 1 time between feed time gap.

Index Terms- GSM, Remote controlled, audio call for meal, dual supply, safety lock

I. INTRODUCTION

Automated pet feeder is one of the new technologies for feed pet. It will help pet owner to take care of their pet while they are not at home. Even the owners are not at home, they still can feed their pet. Automated pet feeder is built to help pet owner taking care of their pet. Automated pet feeder is one of the pet feeders that will be controlled by a wireless infra-red remote control. The automated pet feeder will be automatically dispenses predetermined amounts of food at the exact times user choose with controlled by a wireless infra red control remote. As pet lovers, user should understand those pets also need a proper diet management. Sometimes, the responsibilities of life inhibit pet owners from properly caring for their pets. Whether user away from home unexpectedly or simply would like one less chore to worry about, user can feel secure that the beloved pet will be cared for and fed on time, every time.

Pet care should be fun, not burdensome and so the goal of this project is to assist owner with pet care by providing an automatic pet feeder. The purpose of the project helps the owner of the pet feeding their pet on time even when they are not at home. Other than that, it also can help the owner know the diet of their pet.

Knowing the diet of the pet is very important for the owner to make sure that the pet is in good health. This system assist pet owner to feed the pet. The system act in two ways, one is feeding the pet and sends the feeding information to owner. After it feed the pet, the system will stop responding for certain time in order to make sure that the pet do not eat too much.

Features:

1. Feed time:
   This time period is defined as the feed time it defines the duration for which bowl left outside for the feed by the system. This time can be adjusted by user using remote.

2. Time gap between consecutive feeds
   This time period is defined as the repeat time it defines the duration for which the system will be at standby mode after serving feed. This time can be adjusted by user using remote.

3. The quantity of feed served
   This feature is defined as the feed quantity it defines the quantity of food which is going to be served in every feed. This quantity can be adjusted by user using remote.

4. Call for pet at feed time
   This feature is use to call the pet at the time of feed with the owner’s voice which is most familiar to the pet even though the owner is not at home. The system will record your voice and use it every time when the feed is going to be served.

5. Refill alert
   This is refill alert for the owner in case of the container of feed is going to be empty. This will alert to owner by a buzzer and a massage to the owners phone.

6. Dual power supply with battery charger
This feature will help the system to continue its process in case of power cut and power failure. The system will use the battery to operate its basic functionality. This power supply will also auto recharge the battery for use when the AC source is provided to the system.

7. Massage alert system
This feature of the system is used to inform the owner about the refill of feed container and it also alerts owner when the pet is not taking its feed regularly.

8. Safety lock
This feature is for the feed container lid to keep it out reach of the pet and also protect the feed in case the pet tries to down the system or the accidentally system went down.

9. Left feed sensor
This is a sensor based feature which helps system to detect the pet is taking feed or not and basis of this the system will inform the owner by massage and this feature also helps system in given the left feed first to pet at time of feed. This will happen only in case of the amount of left feed is larger.

10. The priority feeder
10.1 By owner
This feature is accessible multiple times by the user. With this feature owner is able to give feed to the pet by its own wish at any time by interrupting the normal process of the system.

10.2 By pet
This feature is also accessible by the pet but for a single time in between two consecutive feeds. If the pet two or three times hit the feed bowl panel the system will provide the feed to pet.

Components:
1. Stepper Motor
A stepper motor is an electromagnetic device that converts digital pulses into mechanical shaft rotation. The shaft or spindlier of stepper motor rotates in discrete step increments when electrical command pulses are applied to it in a proper sequence. [Solarbotics, 2008]. The sequence of the applied pulses is directly related to the direction of motor shafts rotation. The speed of the motor shafts rotation is directly related to the frequency of the input pulses and the length of rotation is directly related to the number of input pulses applied.

2. Microcontroller
There are many types of microcontroller used in the market as the control unit for various types of application. The suitable microcontroller is chosen by the industries based on their need. In this project, the microcontroller acts as the brain of the system because it controls all the action made by the system. In this project, 89c52 microcontroller is used. Microcontrollers store their programs and data in memory. Memory is organized as a contiguous string of addresses, or locations. Each memory location contains eight bits of data. The entire amount of memory that a processor can access is called its address space. The 89c52 has an address space of 65,536 memory locations, corresponding exactly to 16 bits of address information. This means that a 16-bit numeral can be used to point at, or address, any of the memory bytes in the address space of the 89c52.

3. Infra-Red remote control
A remote control is an electronic device used for the remote operation of a machine. Commonly, remote controls are used to issue commands from a distance to consumer electronics. Remote controls for these devices are usually small wireless handheld objects with an array of buttons for adjusting various settings such as track number and volume. In fact, for the majority of modern devices with this kind of control, the remote contains all the function controls while the controlled device itself only has a handful of essential primary controls. Most of these remotes communicate to their respective devices via infrared (IR) signals and a few via radio signals.

4. Opto-isolator
An opto-isolator (or optical isolator, optocoupler, photo coupler, or photomOS) is a device that uses a short optical transmission path to transfer a signal between a transmitter and a receiver, while keeping them electrically isolated. The opto-isolator is a package that contains both an infrared LED and a photo detector such as silicon diode, transistor Darlington pair, or SCR. The wave-length response of each device is tailored to be as identical as possible to permit the highest measure of coupling possible.

5. SIM 900
SIM900 is a complete Quad-band GSM/GPRS module designed by SIMCom. Featuring an industry-standard interface, the SIM900 delivers GSM/GPRS 850/900/1800/1900MHz performance for voice, SMS, Data and Fax in a small form factor and with low power consumption. SIM900 is designed as a DCE (Data Communication Equipment). It provides a full modem serial port, which is used for data transmission and for sending AT commands. The SIM900 is integrated with the TCP/IP protocol; extended TCP/IP AT commands are developed for customers to use the TCP/IP protocol easily, which is very useful for those data transfer applications.

6. Audio recorder and playback
The APR3A33 device offers true single-chip voice recording, non-volatile storage, and playback capability for 680 seconds. The device supports both random and sequential access of multiple messages. Sample rates are user-selectable, allowing designers to customize their design for unique quality and storage time needs. Integrated output amplifier, microphone amplifier, and AGC circuits greatly simplify system design. The device is ideal for use in portable voice recorders, toys, and many other consumer and industrial applications. APLUS integrated achieves these high levels of storage capability by using its proprietary analog/multilevel storage technology implemented in an advanced Flash non-volatile memory process, where each memory cell can store 256 voltage levels.
This technology enables the APR3A33 device to reproduce voice signals in their natural form. It eliminates the need for encoding and compression, which often introduce distortion.

7. Microphone
Microphones are a type of transducer - a device which converts energy from one form to another. Microphones convert acoustical energy (sound waves) into electrical energy (the audio signal).

Different types of microphone have different ways of converting energy but they all share one thing in common: The diaphragm. This is a thin piece of material (such as paper, plastic or aluminum) which vibrates when it is struck by sound waves. In a typical hand-held mic like the one below, the diaphragm is located in the head of the microphone.

When the diaphragm vibrates, it causes other components in the microphone to vibrate. These vibrations are converted into an electrical current which becomes the audio signal.

8. Speaker
In order to translate an electrical signal into an audible sound, speakers contain an electromagnet: a metal coil which creates a magnetic field when an electric current flows through it. This coil behaves much like a normal (permanent) magnet, with one particularly handy property: reversing the direction of the current in the coil flips the poles of the magnet.

Inside a speaker, an electromagnet is placed in front of a permanent magnet. The permanent magnet is fixed firmly into position whereas the electromagnet is mobile. As pulses of electricity pass through the coil of the electromagnet, the direction of its magnetic field is rapidly changed. This means that it is in turn attracted to and repelled from the permanent magnet, vibrating back and forth.

The electromagnet is attached to a cone made of a flexible material such as paper or plastic which amplifies these vibrations, pumping sound waves into the surrounding air and towards your ears.

Inside a speaker:
1. Cone
2. Electromagnet (coil)
3. Permanent magnet

The frequency of the vibrations governs the pitch of the sound produced, and their amplitude affects the volume – turn your stereo up high enough and you might even be able to see the diaphragm covering the cone move.

9. IR Receiver
The TSOP382 is a miniaturized receiver for infrared remote control systems. A PIN diode and a preamplifier are assembled on a lead frame while the epoxy package acts as an IR filter. The demodulated output signal can be directly decoded by a microprocessor. The TSOP382 is compatible with all common IR remote control data formats.

10. Voltage regulators
ICs regulator is mainly used in the circuit to maintain the exact voltage which is followed by the power supply. A regulator is mainly employed with the capacitor connected in parallel to the input terminal and the output terminal of the IC regulator. For the checking of gigantic alterations in the input as well as in the output filter, capacitors are used. While the bypass capacitors are used to check the small period spikes on the input and output level. Bypass capacitors are mainly of small values that are used to bypass the small period pulses straightly into the Earth.

II. RESEARCH ELABORATION
A. PROTEUS
Proteus is a software technology that allows creating clinical executable decision support guidelines with little effort. Indeed, it should be fun creating your own guidelines. Once a guideline for a condition has been created, it can be executed to provide stepwise advice for any patient having that condition. This site is dedicated to the Proteus executable guidelines model, tools based on the Proteus approach and the automated guidelines created using those tools.

A software tool that allows creating and executing clinical decision support guidelines using the Proteus approach is available. The tool called Protean may be downloaded from here. Protean allows creating new guidelines or editing existing ones very easily. Much of the editing is done by dragging and dropping.

The Proteus guidelines are created with modular entities called Knowledge Components (KCs). Each KC represents a clinical activity and is available to the clinician as a module of executable knowledge with its own intelligence.

- The KCs may be easily modified. Simple drag and drop operations constitute significant part of editing.
- The KCs may be reused. For example, a KC created for diagnosis of diabetes can be used in guidelines as disparate as “investigation of coma”, “routine preoperative checkup for major elective surgery”, “investigation of unexplained weight loss” and “evaluation for risk of infection”. One can simply drop a KC in a guideline and begin using it. The KCs are also shareable, therefore anyone who authors guidelines can have a library of pre-built KCs at their disposal to drop and drag in their guideline.
- Experts at remote locations may manage individual KCs, keeping them in sync with the current medical concepts, while the clinicians automatically get the state-of-the-art executable knowledge. This is akin to opening a web page using a hyperlink; the user gets the fresh content by clicking on the same URL when the author of the web page updates it. Unlike a web page however, the Proteus KCs are executable knowledge and not passive information. Each guideline may have many KCs, each being updated by a different expert or a group of experts.
- The intelligent decision-making in the KC comes from the Inference Tools in the Proteus approach. Any thing that can make the inferences that a KC needs can be declared its inference tool. Simple software algorithms, sophisticated artificial intelligence tools or even remote human experts can be specified as inference tools for KCs.
The inference tool can be as easily swapped as they can be declared. Therefore, if a tool with better inferencing capabilities becomes available, it can be used to replace the previous one in a few simple steps.

- The KCs offer a template for capturing data pertaining to the clinical activity that they represent and serve as components of an Electronic Medical Record.

- Since the KCs represent discretely identifiable clinical activities they also allow attaching related elements from the non-clinical processes of healthcare. Each such non-clinical process can be assigned a separate layer, with components within it communicating with a logically related KC in the clinical process. For example, execution of a KC representing Colonoscopy in the clinical process may be linked with an event that increments the list of billable items for the patient. The latter event exists in a parallel process layer called “billing” which gets its hints from the core clinical process as it progresses. This allows conceiving of an integrated healthcare information system with logically related parts and unlimited extensibility.

Proteus is an ambitious approach with a potential to touch many aspects of healthcare. Several prototype software tools developed have validated the core features of the Proteus approach. The experience of development carried out to date suggests that a more exhaustive implementation be created and tested with healthcare professionals.

**B. MICRO VISION KEIL (IDE)**

Compilers are programs used to convert a High Level Language to object code. Desktop compilers produce an output object code for the underlying microprocessor, but not for other microprocessors. I.E the programs written in one of the HLL like ‘C’ will compile the code to run on the system for a particular processor like x86 (underlying microprocessor in the computer). For example compilers for Dos platform is different from the Compilers for Unix platform

So if one wants to define a compiler then compiler is a program that translates source code into object code. The compiler derives its name from the way it works, looking at the entire piece of source code and collecting and reorganizing the instruction. See there is a bit little difference between compiler and an interpreter. Interpreter just interprets whole program at a time while compiler analyzes and execute each line of source code in succession, without looking at the entire program.

The advantage of interpreters is that they can execute a program immediately. Secondly programs produced by compilers run much faster than the same programs executed by an interpreter. However compilers require some time before an executable program emerges. Now as compilers translate source code into object code, which is unique for each type of computer, many compilers are available for the same language.

Regulated power supply is a device that mechanized on DC voltages and also it can uphold its output accurately at a fixed voltage all the time although if there is a significant alteration in the DC input voltage.

**IV. CONCLUSION**

This design of pet feeder provides the features which will make pet care more convenient for both owner and the pet. This system also provides all the information about the pet’s feeding like is it taking feed or not, is it taking feed in proper quantity or not which help in get rid of overfeeding problem. This design also helps in stopping wastage of feed by providing the left feed first. And this design also gives rid of the conventional manual setting of the pet feeders with its interactive remote control. And as go for the advancement some of the features can be modified as using cam at place of sensor for priority feed of pet. And this cam can also provide a small video clip to the owner by multimedia massage of pet at feed time on request.

**REFERENCES**


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