Automatic foot Size Detector and Foot Size Management

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Abstract -Automatic foot size detector and Foot Shop Management System will implement specifically for sales and provide better services for the customers. In this System we try to achieve that the foot geometry technology based on the fact that every person has a special foot shape. This present a new approach for extraction features from foot based on shape geometry. The foot geometry technology based on the fact that every person has a special shape of foot belongs to each person only, which is not affected by factors of time and aging. In this to detect the presence or the level of light system used ULTRSONIC Sensor (HC-HR04), which can also be implemented by image processing by using MATLAB software. This system using both hardware and software combination for detecting the size of foot and maintain the things like stock, budget, requirement of the customers, availability of the stock, etc. The extraction of the individual characteristics to deal with people will help users to get quickly and high accuracy results. Foot geometry system always bases on the biometric features of the foot and some specifics measurements such as length and width of the foot which measured by the ULTRSONIC Sensors use in it. This system uses filters also for getting original images of captured foot, which is also used for recognizing blurred images.

*Key Words:*Biometric recognition, Foot geometry, Php, MySQL.

1. INTRODUCTION

We know that every person has different foot shapes and sizes. Whenever person going to foot shop for purchasing any foot ware, sometimes it may happen that person doesn't know their actual foot size. Shopkeeper will also be going to show different types of foot wares to customers. So, it will create so many conflicts between customer and shopkeeper. To reduce this conflict between both of them, we are implementing the system that will detect the size of person and give the accurate size of the foot.

Automatic foot size detector and Foot Shop Management System will implement specifically for sales and provide better services for the customers. In this System we try to achieve that the foot geometry technology based on the fact that every person has a special foot shape. This present a new approach for extraction features from foot based onshape geometry. The foot geometry technology based on the fact that every person has a special shape of foot belongs to each person only, which is not affected by factors of time and aging. In this to detect the presence or the level of light system used LDR, which can alGr be implemented by image processing by using MATLAB software.

This system using both hardware and software combination for detecting the size of foot and maintain the things like stock, budget, requirement of the customers, availability of the stock, etc. The extraction of the individual characteristics to deal with people will help users to get quickly and high accuracy results. Foot geometry system always bases on the biometric features of the foot and some specifics measurements such as length and width of the foot which measured by the LDR and Sensors use in it. This system uses filters also for getting original images of captured foot, which is also used for recognizing blurred images.

In this system we will use php for front-end development and MySQL for back-end development. MySQL is used to maintain the database for foot ware. On the basis of gender, we will recognize the different foot wares and categorize the different foot wares like chappal, shoes, sandals, etc. After detecting the accurate foot size of the person this system will easily recognize the accurate catalogue of that particular foot ware which is requested by the customer. By using this system shopkeeper will get the information about remaining stock, stock purchased by the customer, and the required stock in shop.

This system will also give receipt to the customer. Just on one click shopkeeper will identify the whole information about each and every stock present in the shop with their prizes.

This system will advantageous because it making perfect choices as per customer need and also reducing human work and will give better results to both customer and shopkeeper.

2. SYSTEM ARCHITECTURE
2.1 HARDWARE MODEL

Figure 1 shows the proposed hardware Architecture that includes four major units 1). Power Supply 2). Ultrasonic sensor 3). Arduino Uno kit 4). LED 5). Wi-Fi module.

Figure1: Hardware Model

Arduino is a microcontroller to control the whole hardware model. We used one switch in this hardware when person keep his foot on the panel then this switch will turn on and working of this model is start. After that, ultrasonic sensor starts to generate sound waves. This ultra-sonic sensor has four pins which are echo pin, trigger pin, vcc pin, GND pin.

Trigger pin is used to generate sound waves. Echo pin is collects data and send it to the Arduino kit. There are three LEDs are used for adjusting the wood sheet to get exact foot size of a person with 2000miliseconds delay in blinking of each LED. We used the 6 volts DC power supply. Wi-Fi module is used to send the received data from Arduino and send it to over the think space online server. This think space server is connected to software model and which converts the size from centimeter to foot size.

2.2 Hardware Architecture

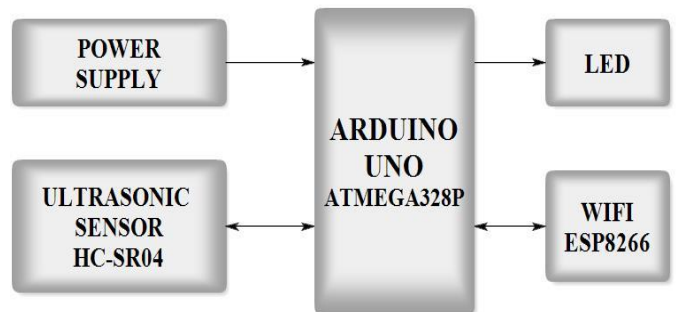Following figure consist of system architecture five components having Arduino is main processing unit.

Figure2: Hardware Architecture

2.2.1 Power Supply

The Arduino kit can be powered through the USB connection or with external power supply. The source of power supply is selected automatically.

The non- USB power can come either from AC to Dc adapter or the battery. This adapter can be connected by plugging 2.1mm center positive plug into board 's power jack. The leads from battery which can be inserted in the ground and VIN pins headers of the POWER connector.

The board can be operating on external supply of 6 to 20 volts. when it supplied it with less than 7 volts [3].

Figure 3: Power Supply

2.2.2 ultrasonic sensor(HC-SR04)

The ultrasonic sensor performs on principles of SONAR and RADAR system which used to measure the distance to an object. The ultrasonic sensor generates the high frequency sound which is called as ultrasound waves. If this ultrasound waves hits the object, it has been reflecting as Echo which is sensed by the receiver [2, 4].
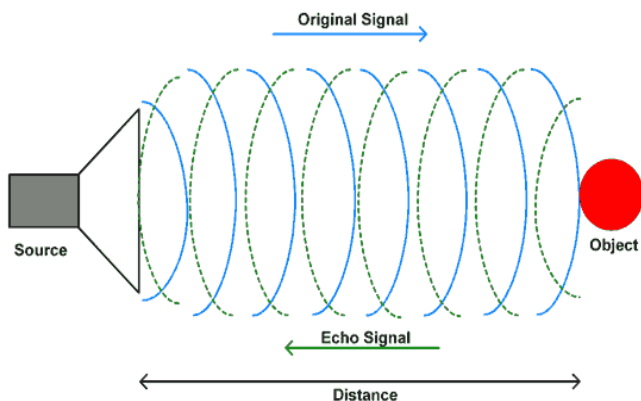
Figure 5: Ultrasonic Working Principle

Ultrasonic Working Principle

We measure the time which is require for the echo to rich to the receiver, we can also measure the distance.
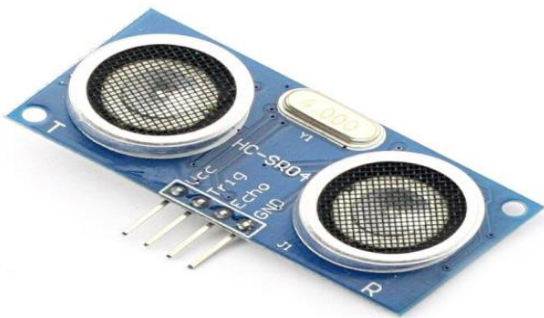

Figure 6: HC-SR-04 Ultrasonic Module

The ultrasonic sensor has ultrasonic transmitter, receiver and control unit. In this module we have to give trigger pulse, so it will generate the sound of the frequency which is 40 kHz. After generating sound wave that is 8 pulses of 40 kHz, so it makes the echo pin is high. [2,4]

2.2.3 Arduino UNO (ATMEGA 328P)

The Arduino is an open source platform which is used for building the electronic project. In our project we use both the hardware and software model. so we required Arduino UNO kit [1].
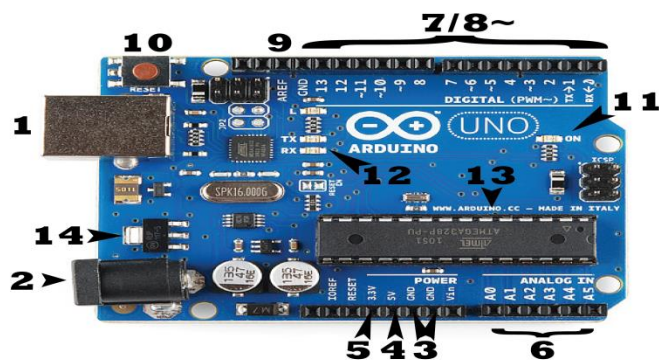

Figure 7: - Arduino UNO Board

The Arduino consist both physical programmable circuit board which is called as microcontroller and piece of software IDE which runs on our computer, which is use to write and upload the computer coding to microcontroller[1].

2.3.4 ESP8266(WIFI Module)

ESP8266 is Wi-Fi which is enabled system on chip module developed by the Espressif system. This module is mainly use for development of IoT embedded application.

Figure 8: - ESP8266 (Wi-Fi Module)

ESP8266 module is low cost standalone wireless transceiver that can be used for end point IoT development. For communicating with this module, microcontroller needs to use set of AT commends[2].

2.2.4 LED(Light Emitting Diode)

The LED light is an electric light for use in light fixtures which produces light using LED. The LED have life spam and electrical efficiency which are serval time greater then incandescent lamp and which are significantly more efficient than most fluorescent light, with some chips which able to emits the light more than 3 hundred lumens per watt[4].
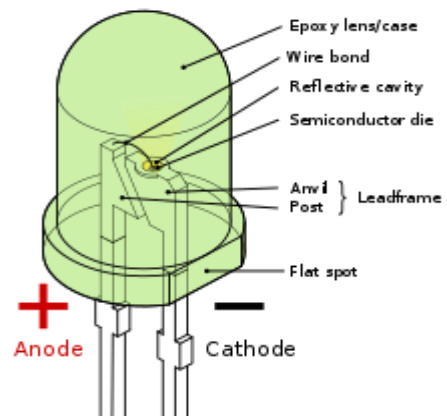

Figure 9: - LED

3. Software Component

In this paper we already discussed the hardware model so we have to discuss the software model. Therefore, we need software requirement to developed the software model for this project.

3.1 Front end:

InSoftware component we used two front end languages first one is HTML which is called web page designing language and another is PHP which is a server-side scripting language.

3.1.1 HTML

HTML stands for Hypertext markup language which is used to create webpages, web application. In this paper we used HTML as a Frontend for designing for webpages for the project HTML is used to inserting program which is return in scripting language such is java script, HTML affect the behavior and contents of the web pages.

3.1.2 PHP

The PHP program may be inserted into HTML program or this language can be used in the combination with various web template system, web contents management system and web framework. PHP code is usually process by a PHP interpreter implemented as a module in the web server or as a common gateway interface (CGI) executable.

3.2 Back end As a My-Sql

Mostly MY-SQL is used**as a** backend. My-Sql 5.5 delivers significant Enhancements enabling users to improve the performance and scalability of web application across multiple operating environments, including Windows, Linux, Oracle Solaris and MAC OS, X.

3.3 Technology Details

3.3.1 Apache tomcat Server:

Apache supports verity of features, many implemented as compiled modules which extend the core functionality. These can range from server-side programming language support to authentication schemes.

3.3.2 Notepad ++:

Notepad ++ is a text editor and source code editor for use with Microsoft Windows. Unlike notepad the built-In Windows text editor, which supports tabbed editing, which allows working with multiple open files in single window.

4. Software Model

Software model consist of two panels one of is Admin Panel and another is User Panel. We have described each panel one by one as follows:

4.1 Admin Panel:

In this panel, firstly the shop owner is log on with their login ID and password.
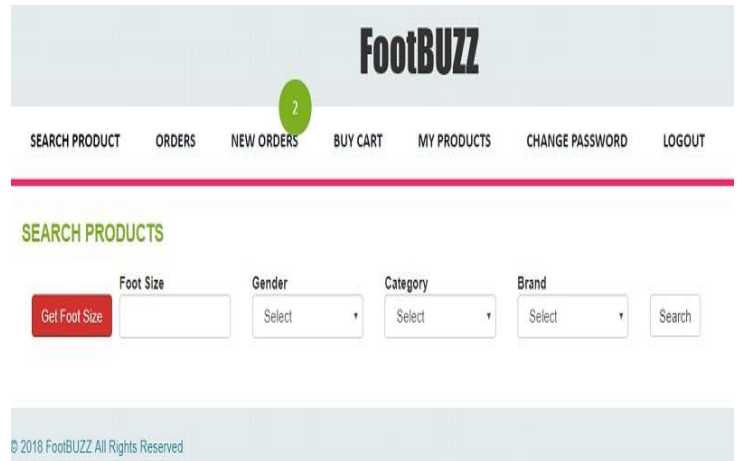

Figure 10: Admin Panel

We have used the login ID as Admin and password is also a admin. When owner is logon the admin panel is open. In this panel, there are different fields we used for different operations.

When owner is clicked on search product then one window is open which contains Get Foot Size field. This option is used when user keep his foot on foot panel then this hardware automatically gets the accurate foot size and then this size is included in the software model. The admin panel manages the whole options which is used in the shop they are order, new order, buy cart, change password and logout.

4.2 User Panel:

The other panel of software model is user panel. The user panel is mainly depending on users or customers.
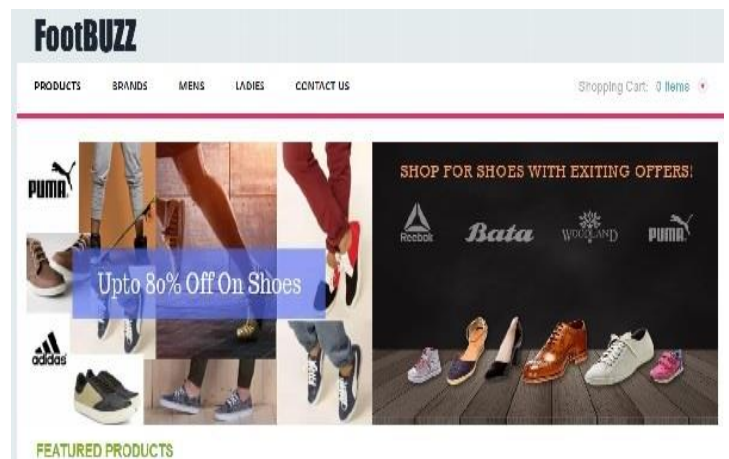

Figure 11: User Panel

In this panel, customer can select the different footwear as per customer's requirements. In this panel customer can choose the footwear in both ways as online and also offline. In online mode customer can choose footwear in the particular foot-shop's website.

5.Flowchart

In this following figure, the main thing is that the admin panel foot buzz. After that the owner will login then one condition is occurred that is the login Id and password will check. If the username and password is found to be correct then this condition will have satisfied. Then the owner will search the products. Owner will also check the orders that means the owner will know how much product will purchased from the shop. After that, when the customer selects the footwears whatever he wants then this all are add in the buy cart. We used both online and offline schemes so, new order is mainly used when user wants to choose the footwear through online then all this order are added in the new order field. All this stored in the database. Also, there are different fields like my products, purchase stock and change password, reports, contact and logout. If condition will false then this system shows one message to the owner that this username or password is invalid.
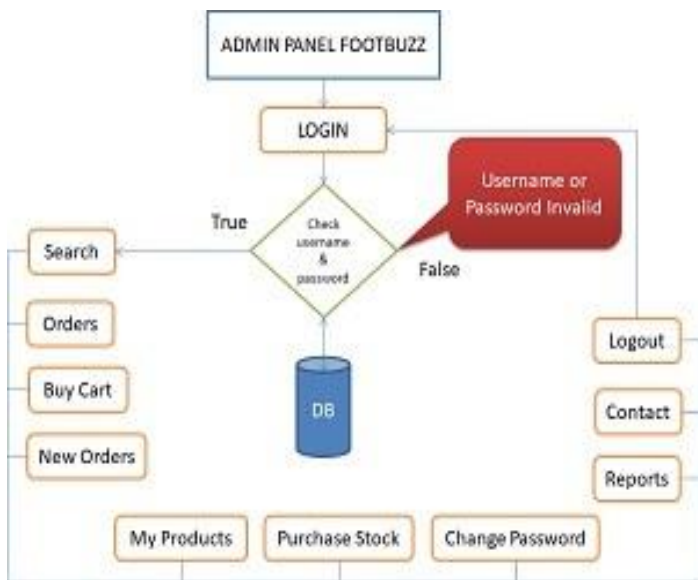

Figure 12: Flowchart

5. Advantages & Disadvantages

5.1 Advantages

1. **High Efficiency:**
   This system provides high efficiency towards customer. Because this system supports the automation concept. All the manual work can be done automatically with the help of this system. So, this system is very useful and efficient to use and provides quick and better results.

2. **Easy to Use:**
   This system is very reliable. So, this system is very easy to use. This system is easily handled by the shop owner as well as customer also.

3. **High Security:**
   This system provides high security because, this system has one server which is in out of country that is the think space server that it provides the data to the device such as like PC's and each device or PC has its unique IP address. So, there is no confidential data is transferred to unauthorized person. That is, the data must be secure. That's why, this system provides the high security to the shop owner as well as customer also.

4. **Customer Satisfaction:**
   The main advantage of this system is the customer satisfaction. As name suggest the system is automatically worked. When the foot size is detected this system displays the different catalogue automatically and then customer chooses the footwear whatever he wants. That means, manual work is reduce. There are no conflicts occur in between customer and shop keeper easily result will displayed on the monitors.

5. **Flexibility:**
   This system has the advantage as it is flexible to use because, the system will provide both the online as well as offline procedure. That means, customer will purchase the footwear with the help of online as well as offline both.

6. **Reduce Human Work:**
   This system works automatically which is done by shop keeper. So, the human work is reduced.

7. **Reduce Time Consumption:**
   Manually, to purchase the footwear customer wastes lots of time so no customer as well as shopkeeper will be satisfying. For this reason, customer will have disappointed from the shop keeper and also a shop owner. So, this system gives accurate and quick result to the customer so he saves his time. It means this system reduces the time consumption.

8. The one of the advantage of this system, when sometimes person will have injured so, this system is properly extract the accurate foot size and customer wants to purchase the footwear. That means, it doesn't matter to this system that the person is injured or not.

3.2 Disadvantages

4 If any failure occurs in this system like electricity is off then this system will not support it means, all the work which is done by this system is done manually through the shop keeper.

5 Whenever the shop owner will store the new stock in the shop so, it is necessary to entered the data of this stock

into the database. Hence, this process will be continued whenever the shop owner will store the new stock. So, this work is so boring to the shop owner.

6   In the software model, the order part is available there is one disadvantage is that there are multiple orders comes from the customer to purchase the footwear some may be there are fake orders so owner doesn't recognize which is the original order placed here or which is the fake one. So, it is quite dangerous to the shop owner.

7   There is one disadvantage is that when customer wants to purchase the footwear for the child so children has not exacted foot size means children has not proper shape of the foot so, accurate foot size will not detect in the device. But this system overcome this disadvantage is, we manually entered the exact footsie in the system so, the customer will satisfy because this system displays the catalogues for the children also.

8   This system has many modules so the data is stored in the database is also more and this data will be increased continuously so the database become huge so it's quite complex to handle this database properly.

4. Future Scope

Every system has its own future scope. This system also has its future scope because, in today's world automation has great demand so, this system provides the automation. This system mostly reduces the human efforts main is that it gives the customer satisfaction and which is more important to any shop owner. We develop this system for various applications as follows but slight difference will have done with the help of customer requirements.

1.   We implement the system for the garment collection also. Because there are different trends in the peoples based on fashion, style, look and also dressing sense as like in foreigners.

So, in different malls, shapes there are multiple customers are coming so, all of them has its own requirements therefore shop keeper fulfil their requirements but sometimes customer will not satisfy properly and also headache to the shopkeeper to keep the heavy, costly clothes in proper manner. This system will help to the shop keeper and satisfies the customer, this system displays the all catalogues and new and unique collections. This system reduces the headache of the shopkeeper and also shop owner has the records of purchased product, sale products, stock, availability, customer info through date wise, month wise and week wise also.

2.   In future we implement this system for jewellery collections also.

Today's world is fashionable, stylish so they have also required an ethnic, unique, new, designer, party wear jewelleries. So, it will increase the human status.

Most of the times in jewellery shops, customer wants the unique, stylish, designer jewelleries but the shop owner does not show all the jewelleries because some jewelleries are so costly and heavy. This system helps to show the catalogues of the jewelleries and heavy and costly jewelleries also then customer will choose one of them and then shop owner or keeper will show this jewellery. So, this system will help both the shop owner and customer.

3.   This system will help for the other shops, malls in the, market as like general stores, gift stores, sweetmeats, etc…. but in that slightly difference will be done when we develop the system for this all the applications.

7 Implementation

In this system we have used both the hardware and software. When customer keeped his/her foot on hardware panel then switch is automatically on when the customer's foot will have touched to the switch. Then the ultrasonic sensors are activated then it will generate the sound waves then this calculated foot size will have transmitted to the Wi-fi module. This foot size will have transferred to the think space server then this data will have transferred through the Wi-fi module. This calculated foot size will have added to the software module in admin panel. After getting actual foot size customer will select the all required features then this system will show the different catalogues with their color, category, price, images and the brands.
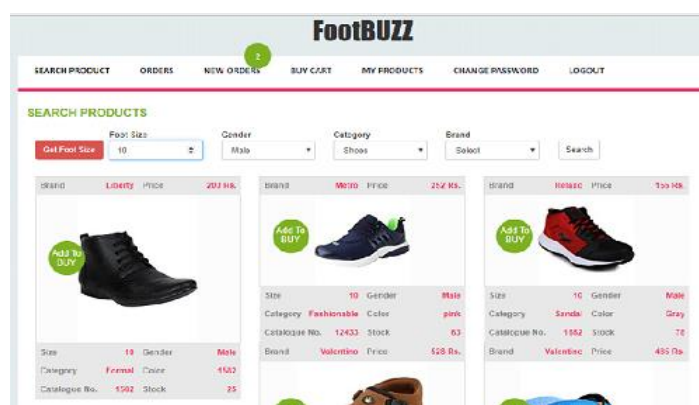

Figure 13: Admin panel after detection foot size

6. CONCLUSIONS

From the experiment results, we have studied the main paper of this system which is implemented in the foreign country. With the help of this paper we implement the automatic foot size detector and foot shop management system. We used the combination of both the software and hardware. In hardware we used the two ultra-sonic sensors to generate the sound

waves. Wi-Fi module and one Arduino kit. When the customer keeps the foot on the foot panel then switch is on automatically then sensors generate the sound waves and get the accurate foot size and then this data will send to the software model through Wi-Fi model and then customer will choose the footwear and all the procedure will have done. Finally, we get the accurate footsie and customer is purchase the footwear.

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