Solar Coin based Universal Mobile Battery Charger

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ABSTRACT

This system describes coin based mobile charger using solar system which provides service in public areas. This will be very beneficial for the people who need to stay out of house for a long time for a work. In such times their phone do not stay on for such long hours. This is because it becomes very difficult for the people to charge their mobile phones in case of emergencies. In order to use this system, all the user needs to insert the coin into machine. In this proposed system image processing(MATLAB) is used for the correct coin detection and also based on weight (using Force sensing resistor). There will be specific time slot for charging based on different Indian currencies. Thus this application really benefits for the people in public area's like Railway station, hospitals etc.

Keyword: *Mobile charger, Solar energy, Solar panel, Relay.*

1. INTRODUCTION

Most of the people do their work on mobile phones so mobile phone is necessary in today's life. And sometime people may face problem of mobile charging. so, to solve this problem we are going to design a device re. with the help of which people can charge mobile at anytime and anywhere. The growth of mobile phone market is phenomenal in recent years and the need for charging the mobile battery is required. In many developing countries the power is not available for few hours to several hours on daily basis especially in semi urban and rural areas where the mobile phones are the essential communication device. In the event of unpredictable power and availability of abundant solar power. a coin based universal mobile battery charger is designed and developed in this paper. This device is like a vending machine for mobile battery charging at kiosks and the user has to plug the phone into one of the adapters and insert a coin for charging at a constant current for a definite duration.

2. HARDWARE REQUIREMENT:

1.Arduino
2.Relay
3.USB cord
4.Solar panel
5.USB Camera
6.USB to TTL Converter
7.FSR
8.LED
9.Battery

3. SOFTWARE REQUIREMENTS:

1. MATLAB

2. Arduino IDE
3. Diptrace.

4. LITERATURE SURVEY:

1.In this paper, a novel type of coin based cell phone charger has been designed. The coin based cell phone charger is worked according to the coding written in the 89c51 microcontroller IC. When we put a coin, the coin detector detects the coin and the input is given to the controller. The charging current is up to 4.5AH @ 6vDC. (Coin Based Cell Phone Charger, IJERT 2013)

2.This paper describes coin based mobile charger using solar tracking system. The coin-based cell phone charger is based on Atmel89c51 microcontroller. The charging Time period is calculated by using Atmel 89c51 microcontroller. (Coin based mobile charger using Solar tracking system, IJARECE 2013)

3.This system uses ARM7 microcontroller. In this system charging Current is up to 5AH@ 6VDC.Programming At Pc Using VB 6.0 (COIN BASED MOBILE CHARGER USING SOLAR,IJEEDC 2015).

4.1 PROPOSED SYSTEM:

In addition to the existing system, in our system we will Use natural source of energy for power and open source nature Microcontroller, coin detection using MATLAB and FSR which will determine the weight of coin. And we are going to use TURBO charger as it provides fast charging and It usually ranges between 6V to 12V depending upon your battery capacity.

5. SYSTEM OVERVIEW:

5.1 BLOCK DIAGRAM

This section will elucidate our proposed system much more. Below shown is the block diagram of the system. The block diagram depicts the procedures during the functioning of the system.

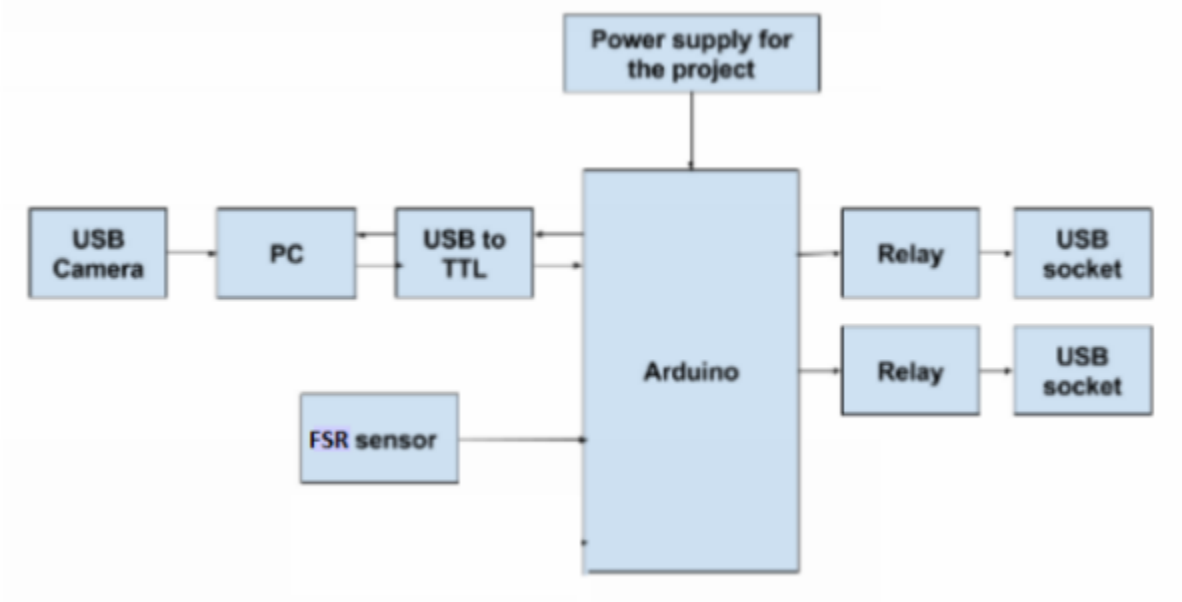


Fig 5.1 Block Diagram

5.2 BLOCK DIAGRAM DESCRIPTION:

5.2.1 ARDUINO:

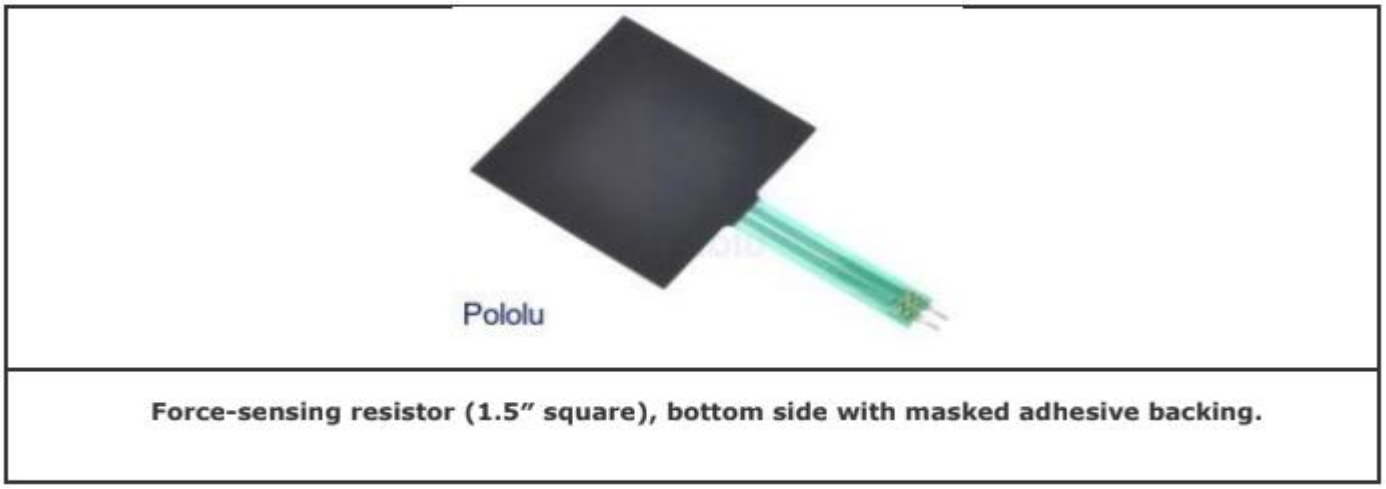
Arduino is a tool for making computers that can sense and control more of the physical world than your desktop computer. It's an open-source physical computing platform based on a simple microcontroller board, and a development environment for writing software for the board. The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, 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 a AC-to-DC adapter or battery to get started.

BLOCK: Microcontroller
TYPE: ATMEGA328
ANALOG/DIGITAL: Digital
PINS FOR INTERFACE: 20 Pins

Fig.5.2.1 Arduino

5.2.2 FSR SENSOR:

This is a force sensitive resistor with a square, 1.75x1.5", sensing area. This FSR will vary its resistance depending on how much pressure is being applied to the sensing area. The harder the force, the lower the resistance. When no pressure is being applied to the FSR its resistance will be larger than 1MΩ. This FSR can sense applied force anywhere in the range of 100g-10kg. These sensors are simple to set up and great for sensing pressure, but they aren't incredibly accurate. Use them to sense if it's being squeezed, but you may not want to use it as a scale.



Force-sensing resistor (1.5" square), bottom side with masked adhesive backing.

5.2.3 RELAY:

A relay is an electrical switch that uses an electromagnet to move the switch from the off to on position instead of a person moving the switch. It takes a relatively small amount of power to turn on a relay but the relay can control something that draws much more power. A relay is used to control the air conditioner in your home. The AC unit probably runs off of 220VAC at around 30A. That's 6600 Watts! The coil that controls the relay may only need a few watts to pull the contacts together.

BLOCK: Output
TYPE: Electromagnetic Relay
ANALOG/DIGITAL: Digital
PINS FOR INTERFACE: 1 Pins

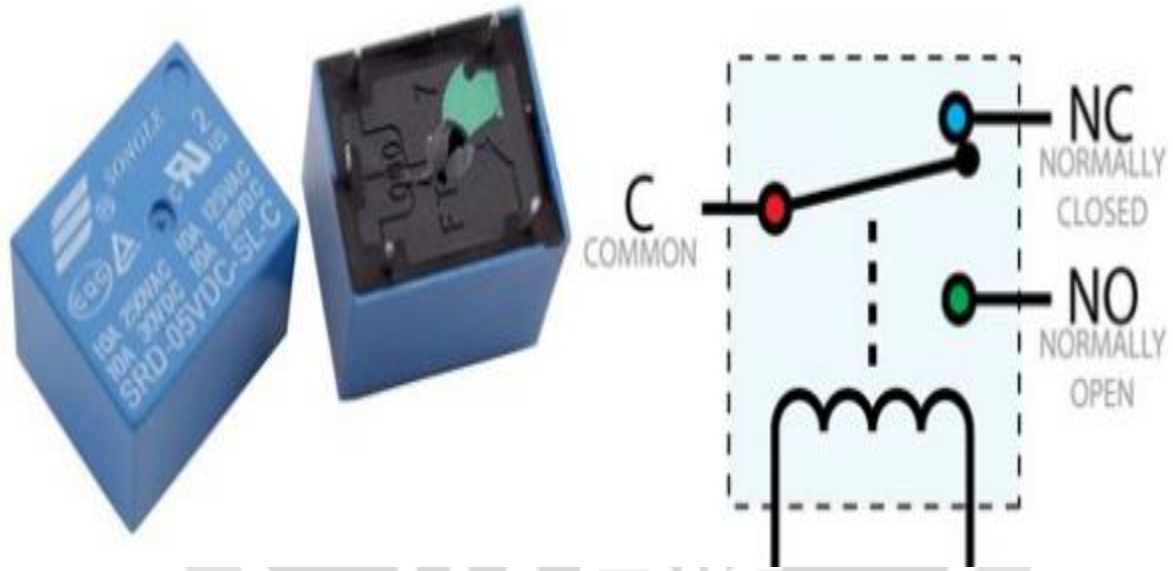
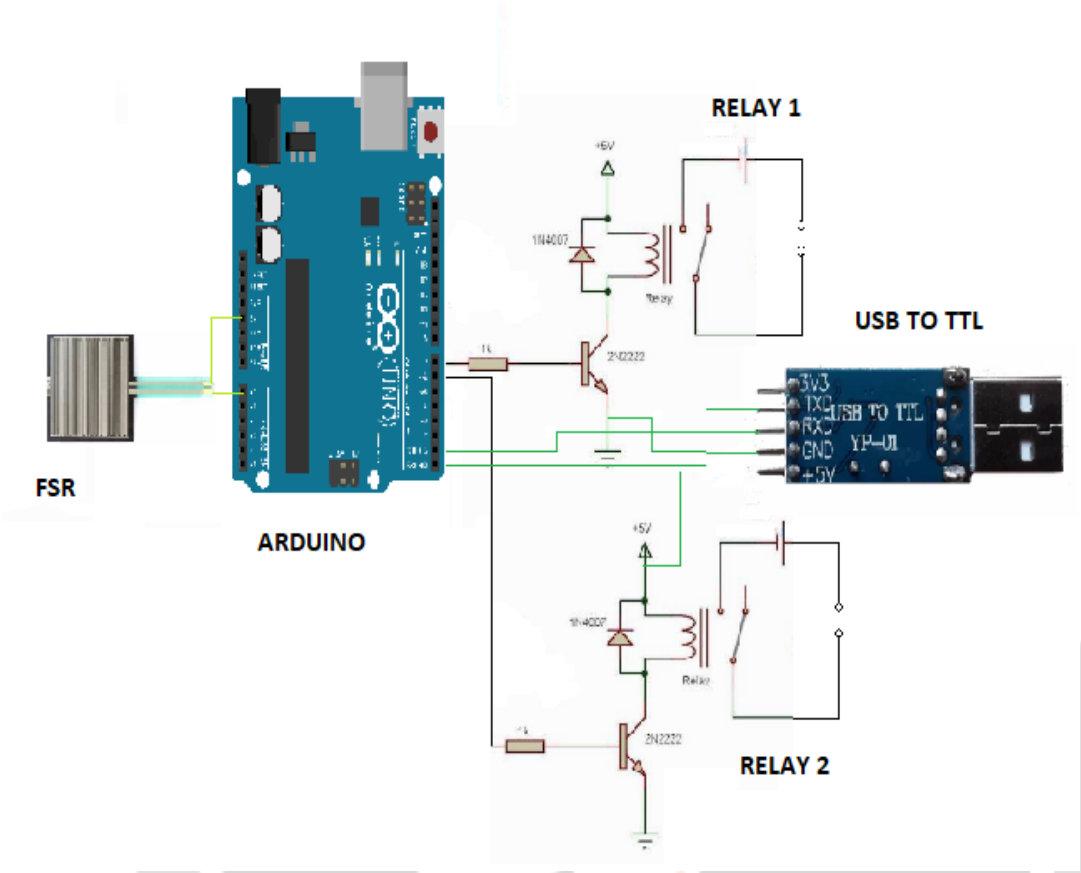


Fig.5.2.3 Relay

5.2.4 POWER:

The Arduino Uno can be powered via the USB connection or with an external power supply. The power source is selected automatically. External (non-USB) power can come either from an AC- to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the Gnd and Vin pin headers of the POWER connector. The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

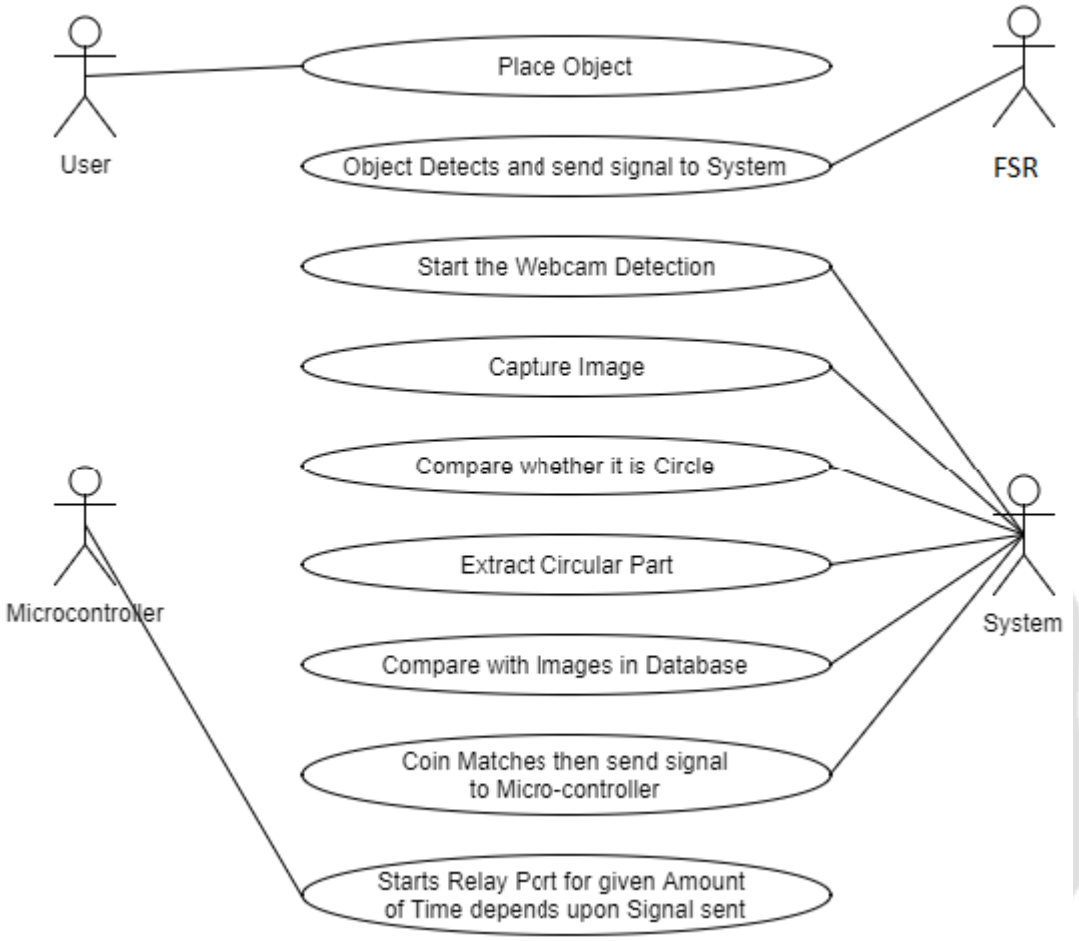
6. CIRCUIT DIAGRAM:



7. FLOW OF WORKING:

1. First the person will place a coin in front of webcam the FSR sensor will detect the object kept and will communicate to the PC to start the detection using webcam. FSR sensor also will measure weight of respective coin.
2. After USB camera captures the image it sends the same to PC , here it gets processed using MATLAB.
3. After the detection PC send signal to Arduino to allocate the slot as per the coin detected for a particular amount of time.
4. If in the mean another coin is placed and the first slot for charging is already allocated the after running the program the second slot gets allocated as per the coin detection and respective time will be allocated.
5. Solar panel will be of 6 V and the output will be using led.
6. Coin background should be black.
7. We are using correlation algorithm for coin detection and comparison. research work Conclusion related your research work Conclusion related your research work Conclusion related your research work Conclusion related your research work Conclusion related your research work

8. USE CASE DIAGRAM:



9. CONCLUSION:

In this paper, a novel method of charging mobile batteries of different manufacturers using solar power has been designed and developed for rural and remote areas where the grid power is not available all the time. In this project, to solve the problem of mobile charging we are designing this device. Because now days the necessity of communication is very important, so every person having cell phone but every time we cannot carry charger with us.

10. REFERENCES:

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