

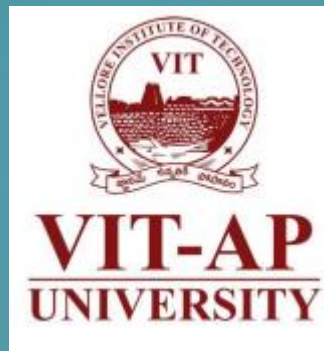
ARDUINO BASED SMART VACUUM CLEANER

ECS1001:ENGINEERING CLINIC'S

(ARDUINO USING EMBEDDED C)

FALL SEM 2022-23





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IDENTIFICATION OF THE PROBLEM

IDEA:-

- In a present-day scenario, we all are so busy with our work that we don't have the time for cleaning our house properly. The solution to the problem is very simple, you just need to buy a domestic vacuum cleaner
- The purpose of this project is to clean a room floor from small debris and dust/dirt autonomously.

WORKING AND IMPLIMENTATION:-

- So today, we decided to make a simple Floor cleaner robot, which is not only simple to make but costs very less compared to commercial products available in the market
- The new Arduino Vacuum Cleaner we are going to build here will be compact and more practical.
- On top of that, this robot will have ultrasonic sensors and an IR proximity sensor. The ultrasonic sensor will allow the robot to avoid obstacles so that it can move freely until the room is properly cleaned.

REQUIRED COMPONENTS

#1 Gear motor with wheel

- Operating Voltage 3V - 12V DC and No load current 40 - 80 mA
- Capability to absorb shock and vibration as a result of elastic compliance.
- Ability to operate with minimum or no lubrication, due to inherent lubricity.
- The relatively low coefficient of friction.

#2 12v AC to DC Power supply

- Presolderd Wires, wire length 4Inch, output marked with voltage.
- High class component and PCB, IC based accurate voltage regulation

#3 Arduino Uno

- By connecting the Arduino Uno to the USB port of your PC with a USB cable, you can communicate between the Arduino Uno and your PC.
- You can connect an AC adapter(outer diameter 5.5mm, inner diameter 2.1mm) to power the Arduino Uno.

CONTINUE.....

REQUIRED COMPONENTS

#4 Arduino motor shield

- 2 connections for 5v 'hobby' servos connected to the arduino's high-resolution dedicated timer
- 4 h-bridges: L293d chipset provides 0.6a per bridge with thermal shutdown protection
- Up to 2 stepper motors with single coil, double coil or interleaved stepping
- Has internal kickback protection diodes

#5 Servo motor

- Operating speed: 0.12second/60degree (4.8V no load)
- Stall Torque (4.8V): 17.5oz /in (1kg/cm)
- Operating voltage: 3.0V~7.2V
- Temperature range: -30 to +60
- Dead band width: 7usec

#6 Ultrasonic sensor

- Distance measuring module
- Gives accurate readings
- Ultrasonic Sensor module is a transmitter, receiver, and a control circuit. It has a handy and compact build. The operation of this ultrasonic sensor is not affected by sunlight or black material like Sharp rangefinders (although acoustically soft materials like cloth can be difficult to detect).

CONTINUE.....

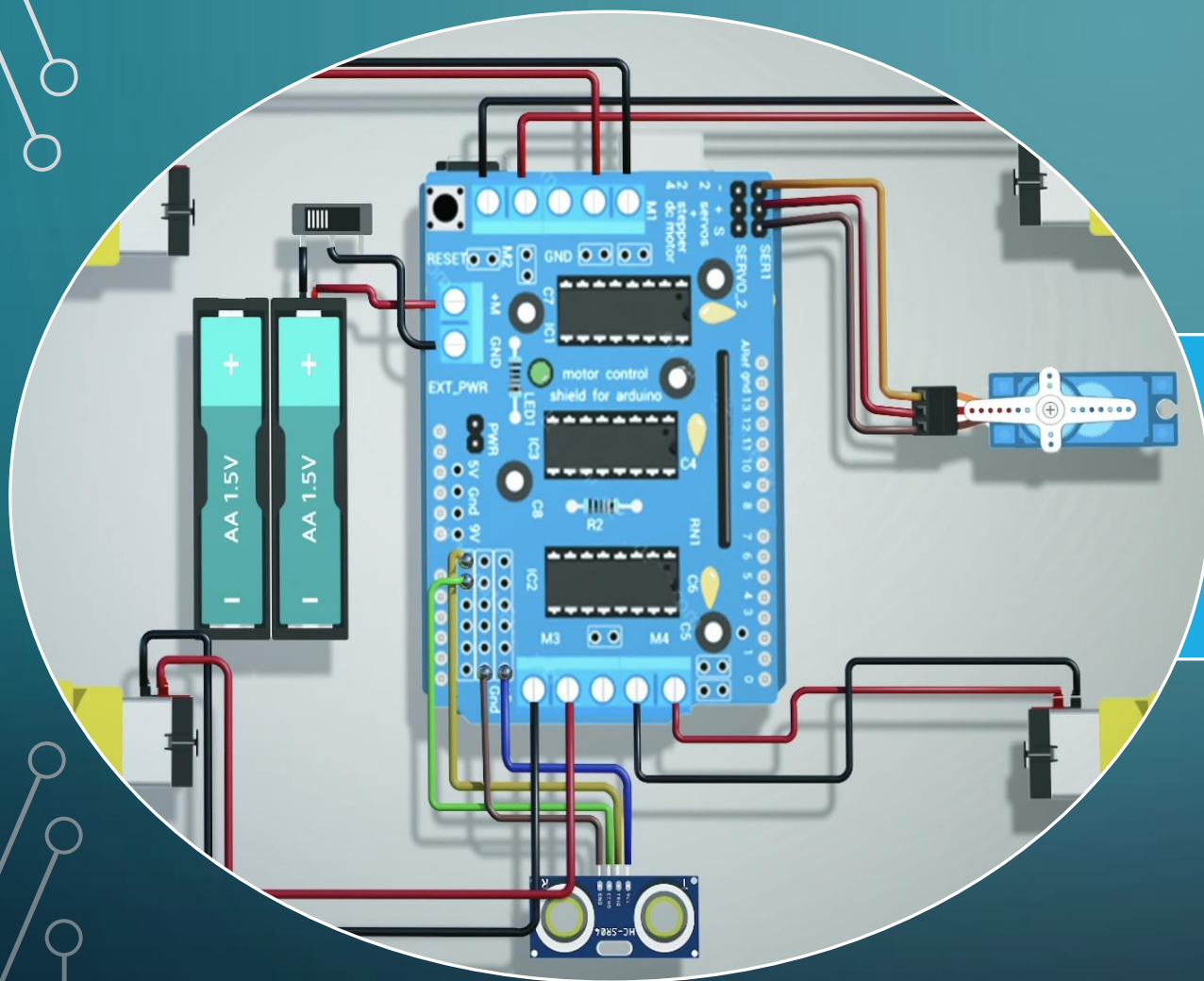
REQUIRED COMPONENTS

#7 6v motor

- one kind of electric motor, and the main function of this is to change the energy from electrical to mechanical
- Voltage: dc 0.5-6v
- Shaft length - 8mm
- High-Speed, for RC Toys and RC Cars

#8 Lithium-ion battery cell

- High capacity, small size, light weight, can be charged/Discharged using same wire any of two Meets to all safety norms for handling, can be used as UPS for CCTV camera DVR etc.



#MODEL CIRCUIT DAIGRAM

APPROXIMATE BUDGET

#1 Gear motor with wheel

• 280/-

#2 12v AC to DC Power supply

• 300/-

#3 Arduino Uno

• 700/-

#4 Arduino motor shield

• 350/-

#5 Servo motor

• 100/-

#6 Ultrasonic sensor

• 150/-

#7 6v motor

• 280/-

#8 Lithium-ion battery cell

• 100/-

Other's

• 500/-

Total:-

• 2480/-

PLAN OF ACTION

#1 Identifying

Core Problem

Project
requirements

Costs Involved

#2 Learning

Authenticity

Reflection

Collaboration

Standards

#3 Implementation

Workflow
Analysis

Design

Build

#4 Testing

Execution

Evaluation

Optimization

TIMELINE OF PROGRESS



#1 Identifying

26th Aug 2022

To

15th Sep 2022



#2 Learning

16th Sept 2022

To

30th Sept 2022



#3 Implementation

1st Oct 2022

To

15th Oct 2022



#4 Testing

16th Oct 2022

To

15th Nov 2022

The background is a teal-to-blue gradient. In the corners, there are white line-art illustrations of circuit boards or neural networks, with lines and small circles representing nodes.

Thank you