



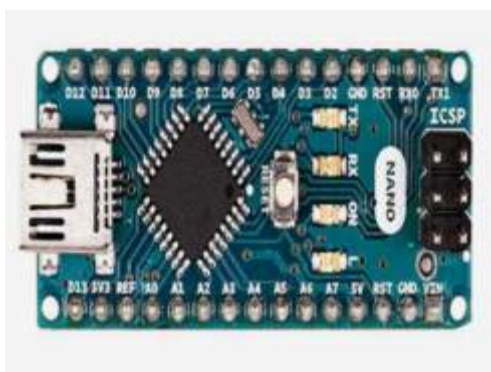
is required. The Arduino software includes a serial monitor which allows simple textual data to be sent to and from the Arduino board. There are two RX and TX LEDs on the arduino board which will flash when data is being transmitted via the USB-to-serial chip and USB connection to the computer (not for serial communication on pins 0 and 1). A Software Serial library allows for serial communication on any of the Uno's digital pins. The ATmega328P also supports I2C (TWI) and SPI communication. The Arduino software includes a Wire library to simplify use of the I2C bus.



### Arduino Nano

The Arduino Nano is a small, complete, and breadboard-friendly board based on the ATmega328 (Arduino Nano 3.x). It has more or less the same functionality of the Arduino Duemilanove, but in a different package. It lacks only a DC power jack, and works with a Mini-B USB cable instead of a standard one.

It is used to produce a clock of precise frequency using constant voltage. There is one limitation using ArduinoNano i.e. it doesn't come with DC power jack, means you can not supply external power source through a battery.



### Accelerometer (MPU6050)

The MPU-6050 devices combine a 3-axis gyroscope and a 3-axis accelerometer on the same silicon die, together with an onboard Digital Motion Processor™ (DMP™), which processes complex 6-axis Motion Fusion algorithms. The device can access external magnetometers or other sensors through an auxiliary master I<sup>2</sup>C bus, allowing the devices to gather a full set of sensor data without intervention from the system processor. The devices are offered in a 4 mm x 4 mm x 0.9 mm QFN package.



### Wi-Fi Module (ESP8266)

The ESP8266 Wi-Fi module is a complete Wi-Fi network where you can easily connect as a serving Wi-Fi adapter, wireless internet access interface to any microcontroller based design on its simple connectivity through Serial Communication or UART interface.

### Camera(V380s)

V380s Mini HD 720P Camera is a two-way Intercom/Audio camera. Wi-Fi connection with multiple users is allowed without a specific display in this camera. Its specifications are :

- 1.Two-way Audio
- 2.Day&Night Vision
- 3.Mobile Remote
- 4.WiFi
- 5.Pan/Tilt

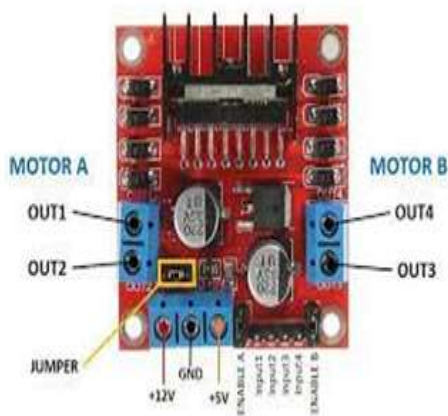


**Motor Driver(L298)**

The L298 is an integrated monolithic circuit in a 15-lead Multiwatt and PowerSO20 packages. It is a high voltage, high current dual full-bridge driver designed to accept standard TTL logic levels and drive inductive loads such as relays, solenoids, DC and stepping motors.

**RF Transmitter**

An RF transmitter module is a small PCB sub-assembly capable of transmitting a radio wave and modulating that wave to carry data. Transmitter modules are usually implemented alongside a microcontroller which will provide data to the module which can be transmitted.



**DC Gear Motor**

A gear motor is an all-in-one combination of a motor and gearbox. The addition of a gear head to a motor reduces the speed while increasing the torque output. Most of our DC motors can be complimented with one of our unique gearheads, providing you with a highly efficient gear motor solution.

**II. CONCLUSIONS**

This project was successful in achieving its aim to balance a two-wheeled self-balancing autonomous robot based on the inverted pendulum model. The control strategy called proportional integral derivative controller to control the trajectory of the robot which calculates an error value.

**ACKNOWLEDGMENT**

Our project would not have been possible without the guidance of Prof. Praveen Chaurasia (Assistant Professor, ECE department, IMS Engineering College, UP, India) and other

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#### **REFERENCES**

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