

Multi purpose Robot

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—<https://github.com/Cyphonvoid/MultiPurposeRobot>

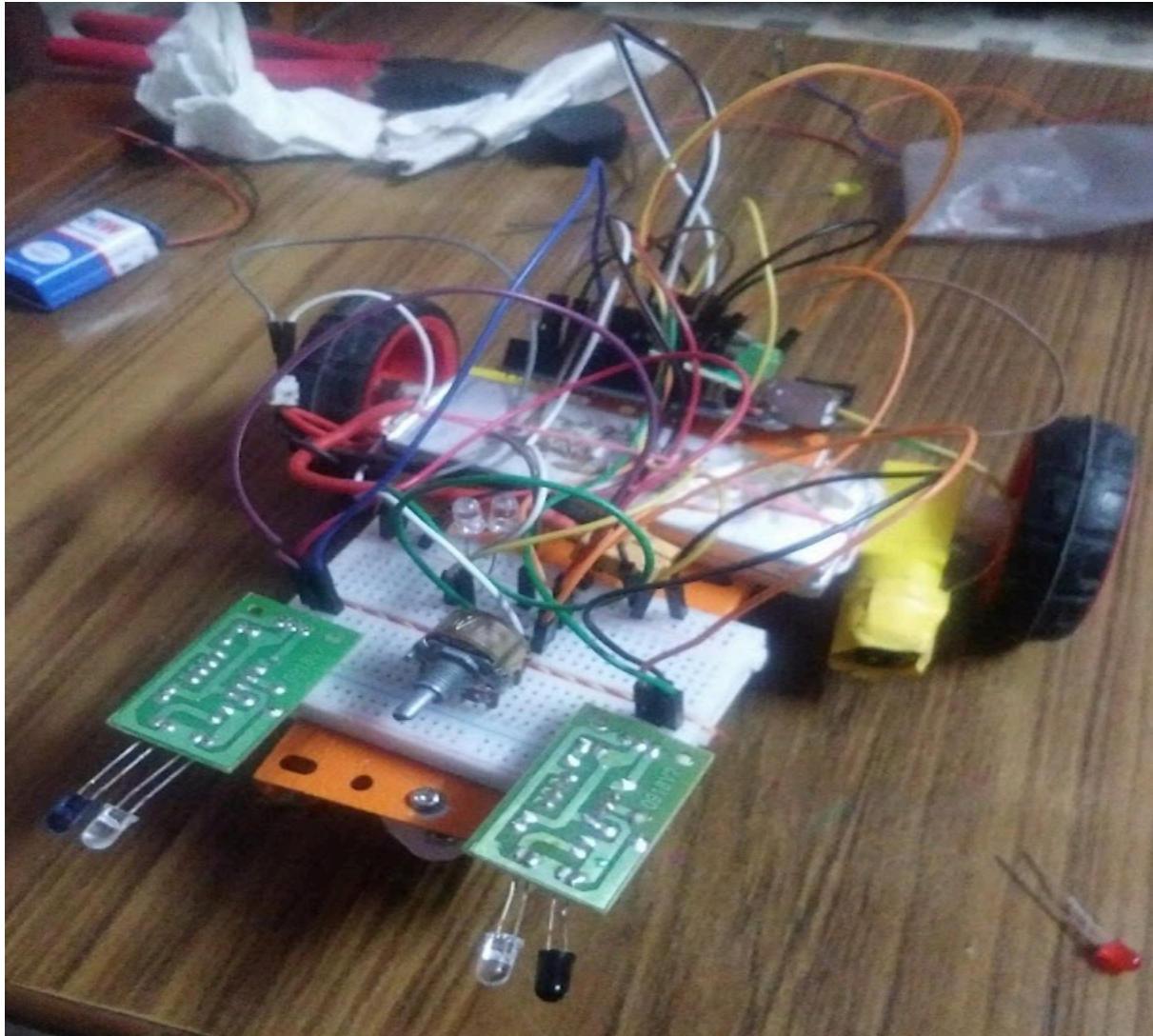
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Overview

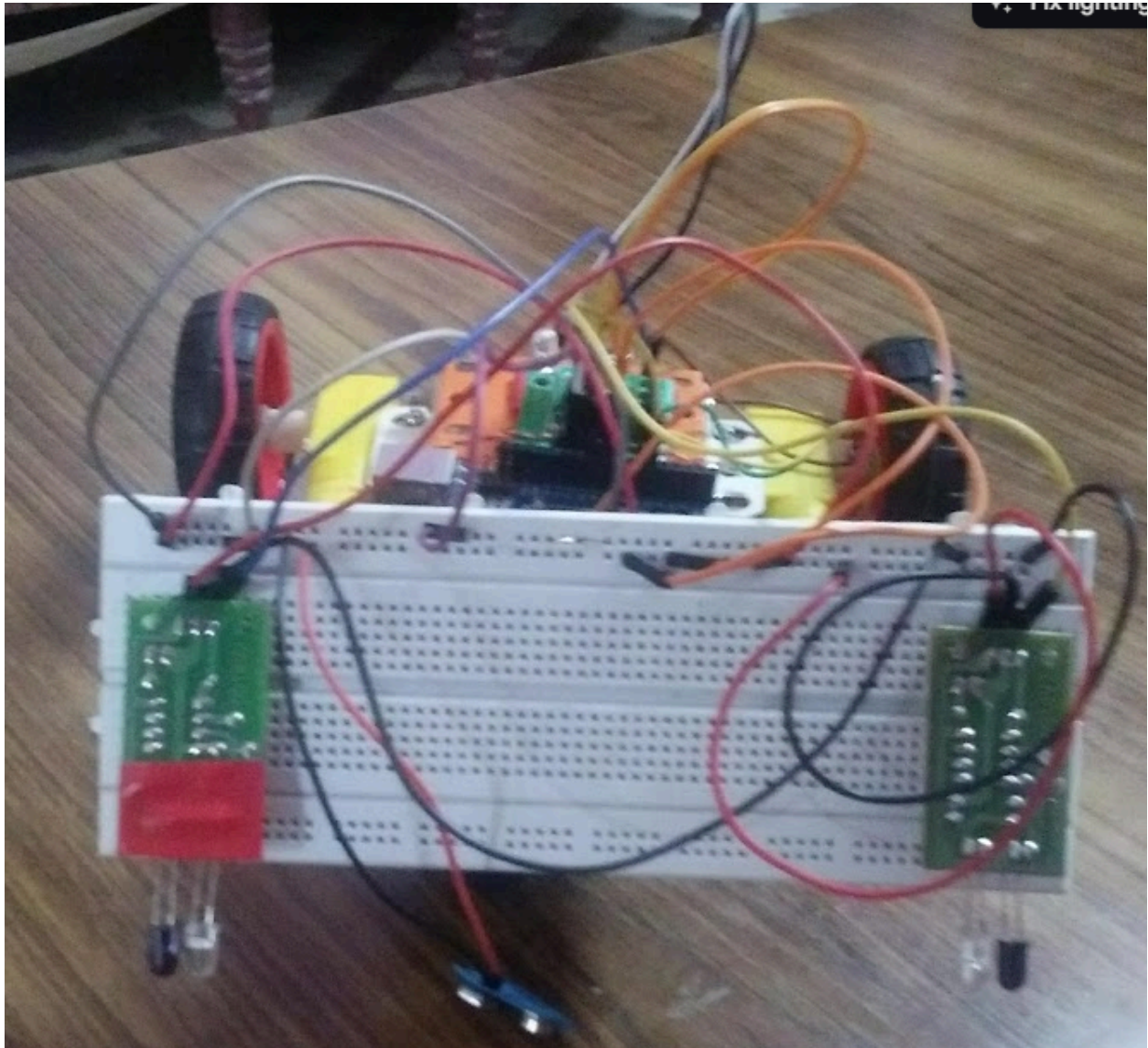
Multi purpose robot is designed to achieve multiple functionalities along with providing an approach to make design more adaptive and extensible by adding more functionalities. Two primary built in functionalities include obstacle avoidance and edge avoidance. Robot uses 3 infrared radiation detection sensors (IR Sensors) for navigation on a plain surface. Arduino is the central hub for all input processing and behavioral control of the robot. At a given time one functionality can be chosen.

Obstacle Avoidance Mode: Allows the robot to avoid nearby objects obstructing the path within sensor proximity. Robot is pre configured to take calculated precautionary steps and maneuvers to dynamically avoid collisions and selecting alternative directions. **NOTE: The image below shows only two sensors. That's because the third sensor got burnt while**

testing, however the idea is still the same.



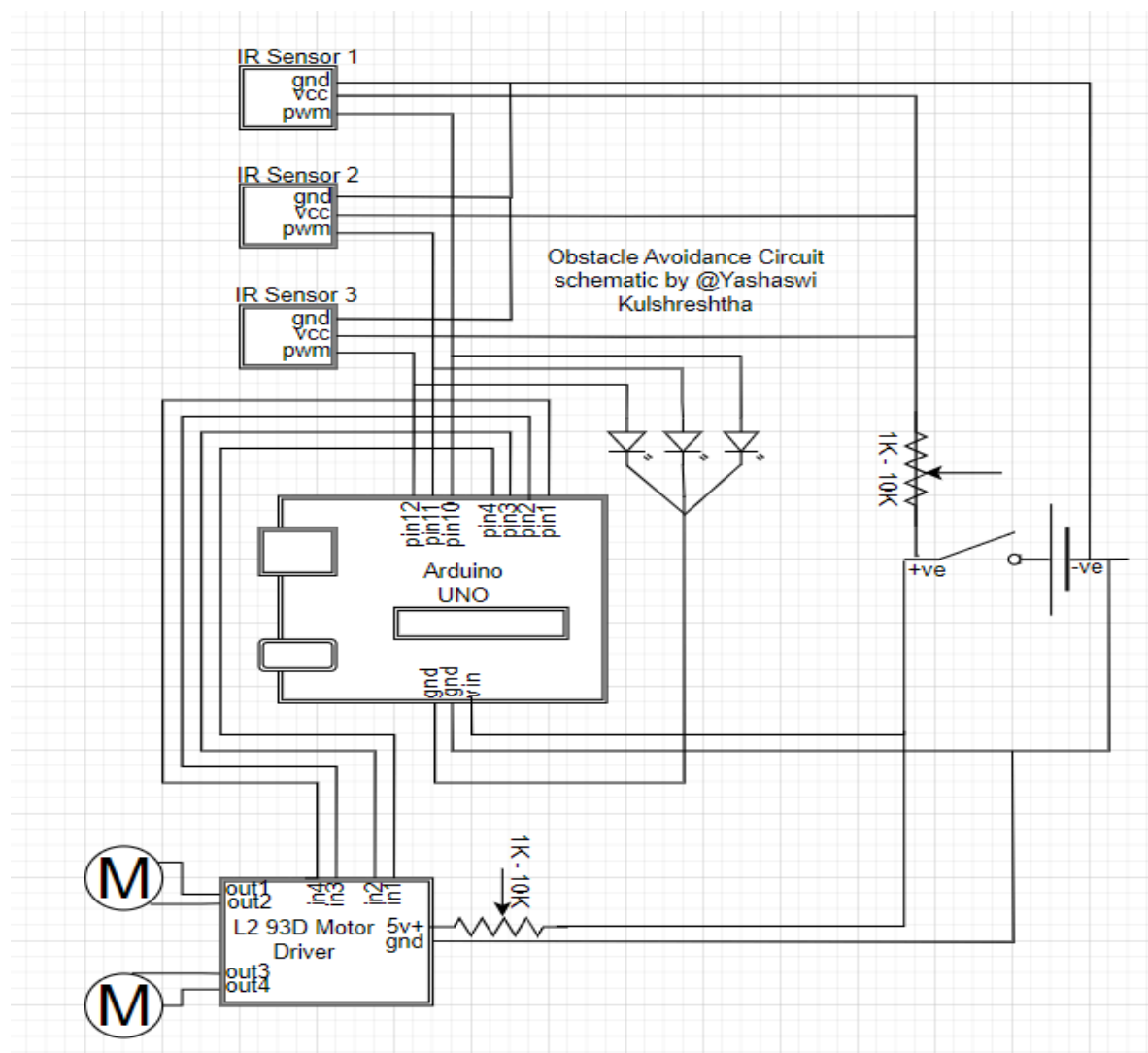
Edge Avoidance Mode: Allows the robot to prevent falling off from the surface by detecting decrease in height of surface. Robots can operate on smooth surfaces with sudden 60-90 degree steep falls. In this mode the physical position of sensors needs to be facing down at the surface 5 cm in front of the head of the robot. This gives the robot a distance of 5 cm to prevent falling off.



Component Specifications

1. Arduino Uno Rev 3 (AtMega microcontroller)
2. Infrared Radiation Sensors (3 Pieces)
3. L293D 5/12V motor driver (1 Piece)
4. Regular LEDS 1.5V (3 Pieces)
5. Power Supply 5/12V 5000mAh
6. Geared 5/12V DC motor (2 Pieces)
7. Variable Resistor (2 Pieces 1kOhm - 10kOhm)

Below is the schematic diagram of all the components and connections used in the project. It's important to NOTE while the diagram doesn't specify supply voltage in the diagram, it is safe to use 5v/12v supply to power the entire robot. Voltage, current and total power received to sensitive components such as IR Sensors can be regulated using variable resistors connected to common +ve. Knobs on the resistors can be rotated to increase or decrease power output.



Schematic representation of circuit including all components used in the project.