Transformer

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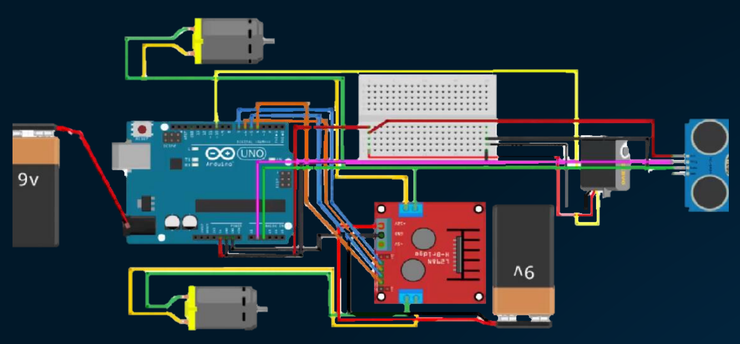
Our Goal

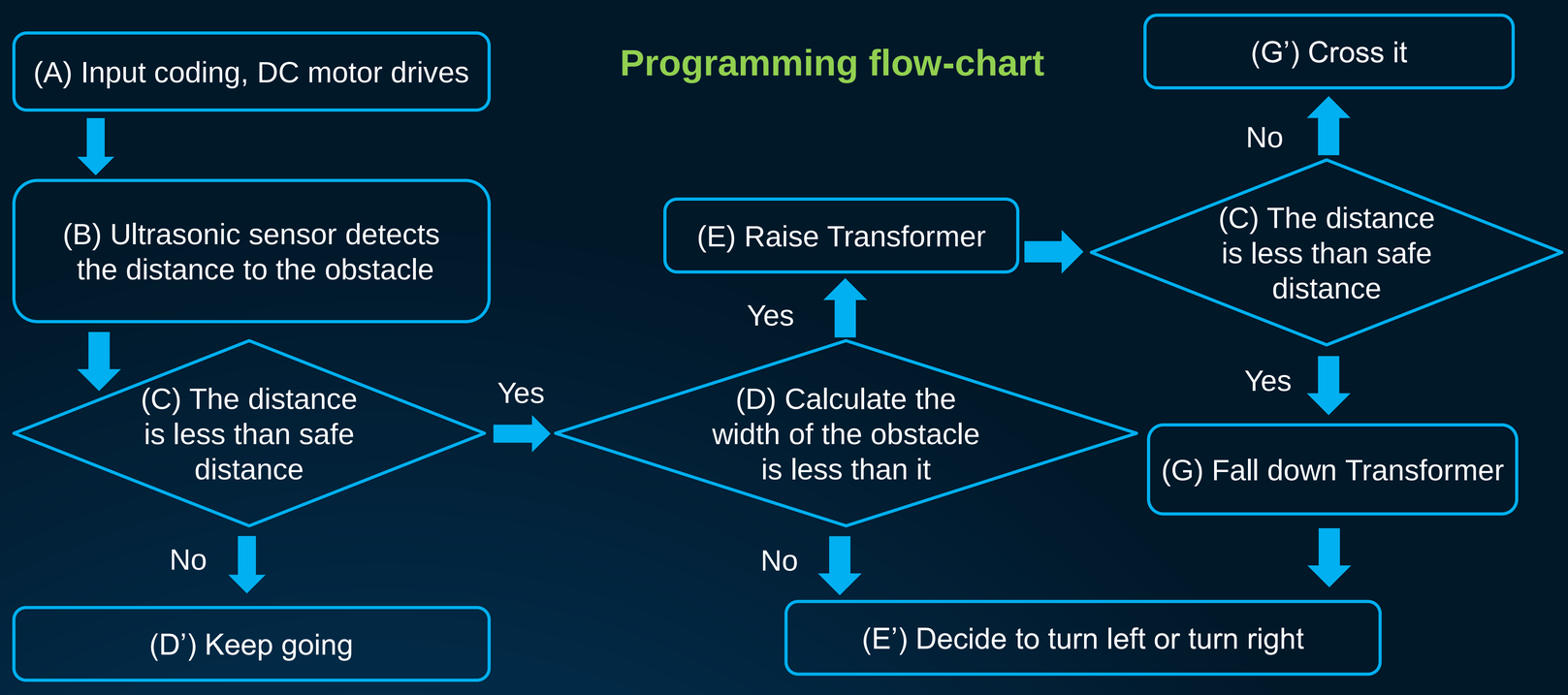
Our device can transform its body to be big or small, named Transformer. We improve the smart car to make it not only avoid obstacle but also cross the obstacle which is small enough. In addition, if the obstacle is bigger than it, Transformer would turn to right direction.



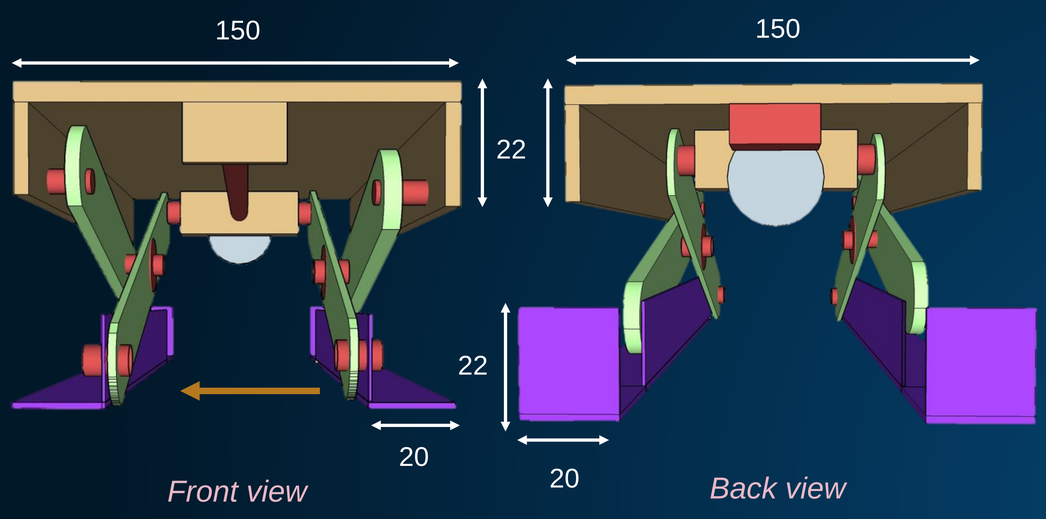
Main circuit to drive the DC motor and servo motor

Refuge or step over?

Programming flow-chart

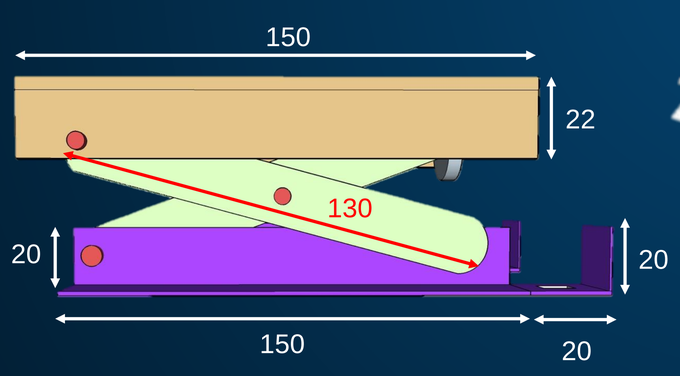


Scissor lift



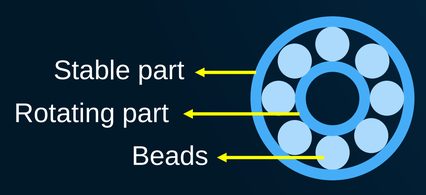
Front view *Back view*

There are a top board, two bottoms, and two pairs of scissors with two bearings. The step motor can rotate the screw and drive the scissors to raise the car body up.

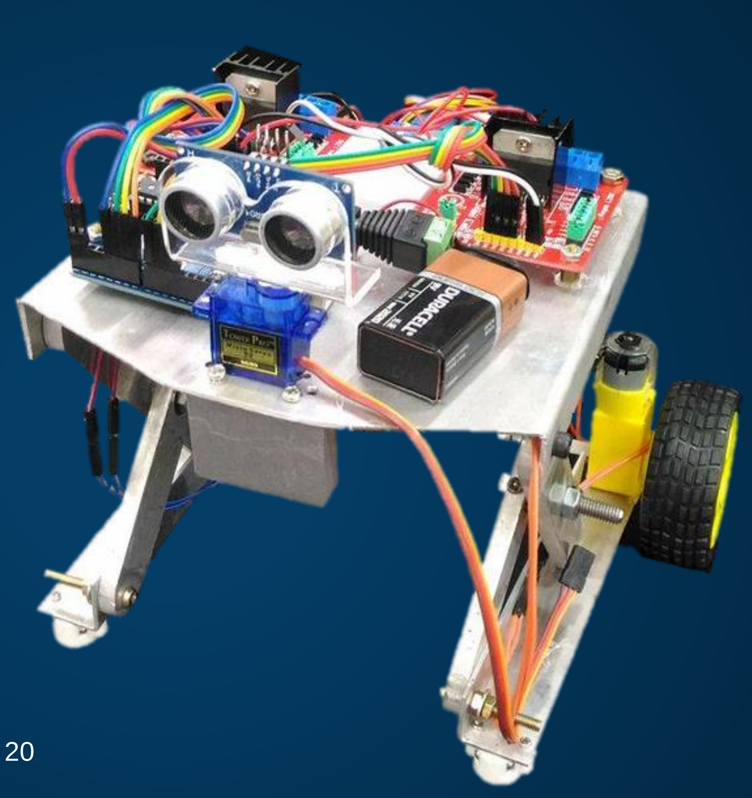


Right view

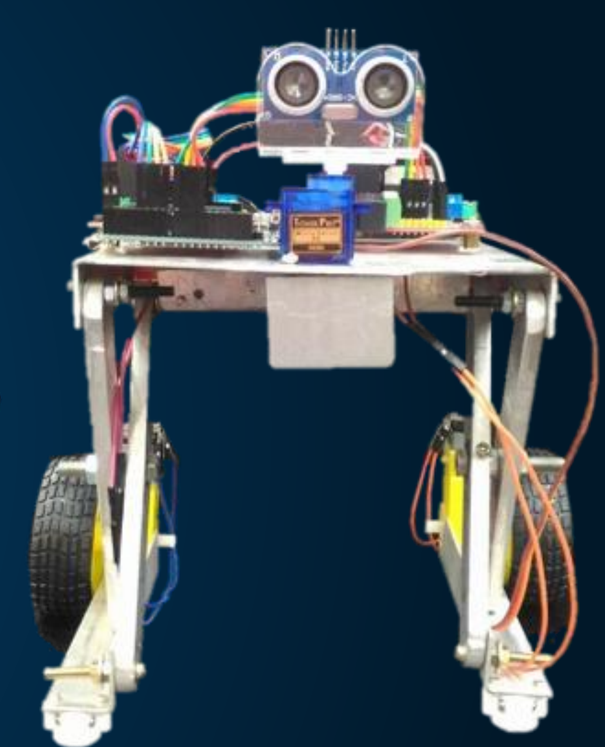
[Unit: mm]



Bearing



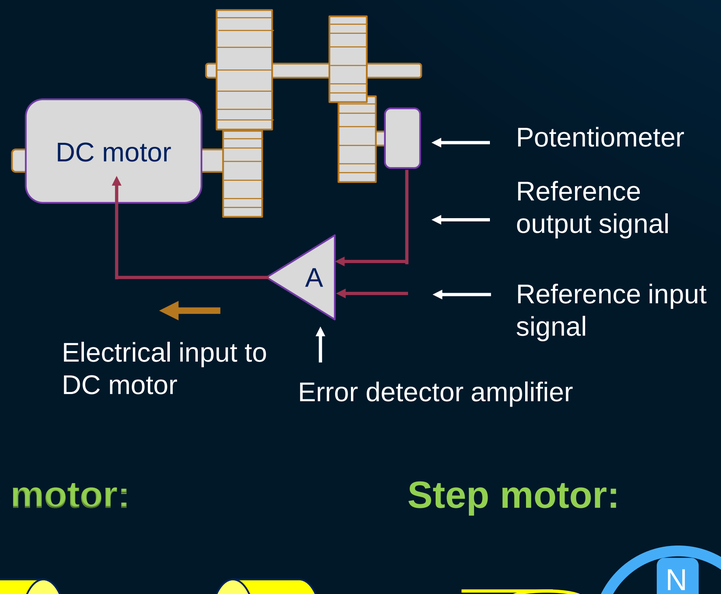
Falling down



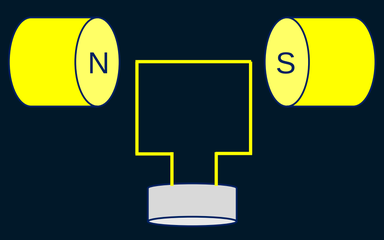
Raising up

Components

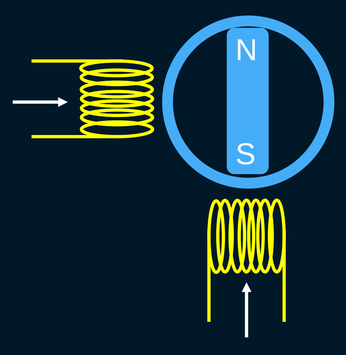
Servo motor:



DC motor:

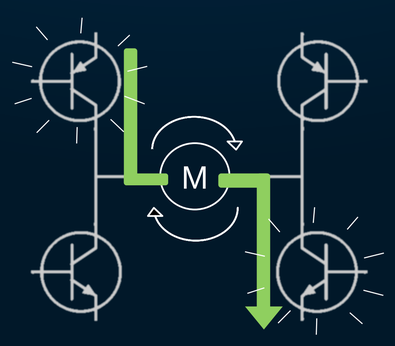


Step motor:

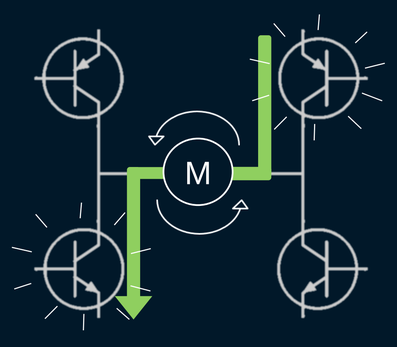


H-Bridge:

With four BJT, it allows DC motors to run forwards or backwards by adjusting the input voltage of the closed switches.

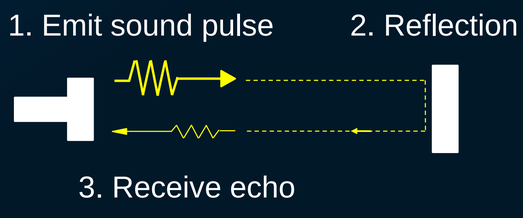


Forwards



Backwards

Ultrasonic sensor:



Conclusion

1. Utilize two DC motors to control the car go forwarding, stopping, backing, and turning around.
2. With the echo difference, the ultrasonic sensor can detect the safe distance.
3. The step motor can drive the scissor and raise up the car body.
4. If the obstacle is bigger, Transformer could turn to right direction.

Reference

[1] https://www.youtube.com/watch?v=tXsP9STxdBc
[2] http://mertarduinotutorial.blogspot.tw/2016/12/arduino-project-tutorial-01-obstacle.html