Autonomous Car- path remembering

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Background

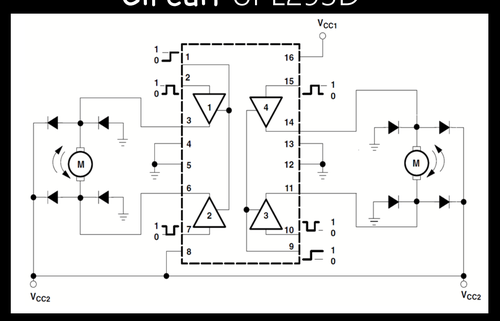
Robot industry has been the new trend nowadays. We can apply the robot in various fields, such as industrial application, military use and probing unknown area. To follow the step of technology, we use what we had learned, such as electronics and computer programming to make the self-driving car.

Goal

To make the self-driving car, we use Arduino card to send command to drive motors. In this work, we designed our self-driving car with three functions including wireless remote control, autonomous avoiding obstacle and memory system, which make our M-car to follow the original routes without controlling.

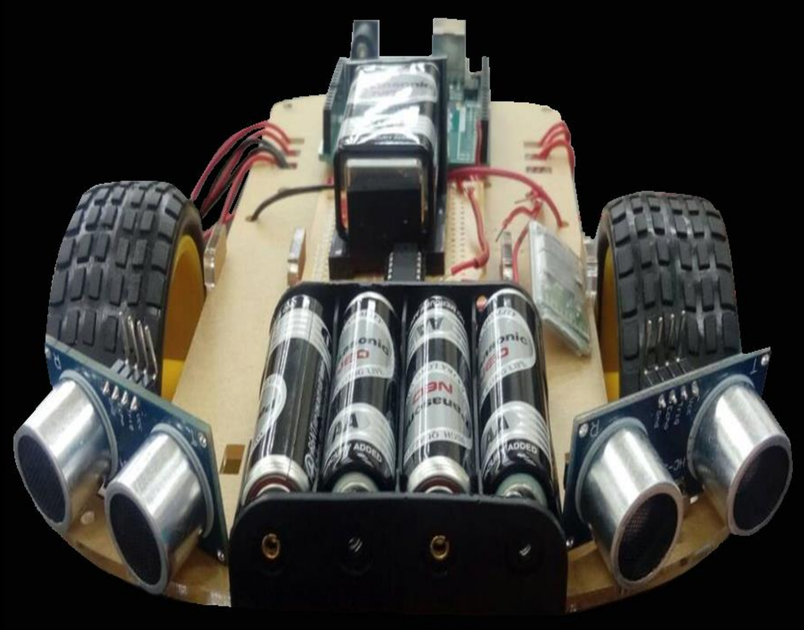
Driving circuit

Circuit of L293D



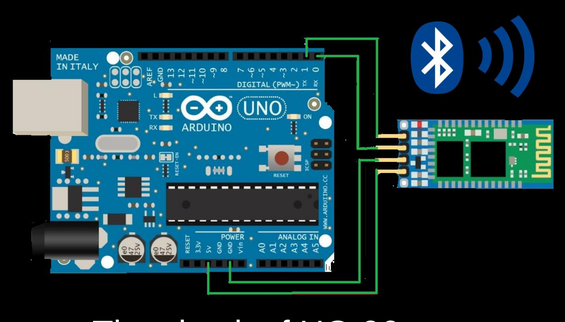
H-bridge

Self-driving car



Remote control

By using Bluetooth, we can control M-car. The Bluetooth IC, HC-06, which can receive the signals from the pairing cell phone. We output the command from the phone and then according to the order, Arduino sends the digital signals to control the motor.



The circuit of HC-06

Control platform

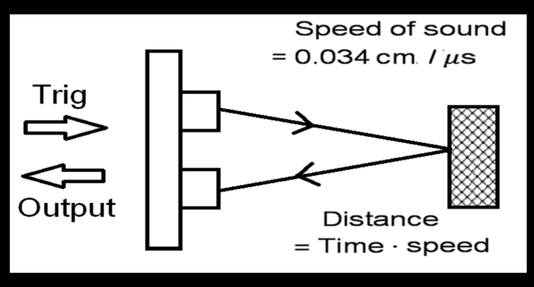
Direction control

To control the direction of the car , we change the direction of current flowing through the motor. We use IC L293D which can receive the digital signal from Arduino to change the voltage across the motor.

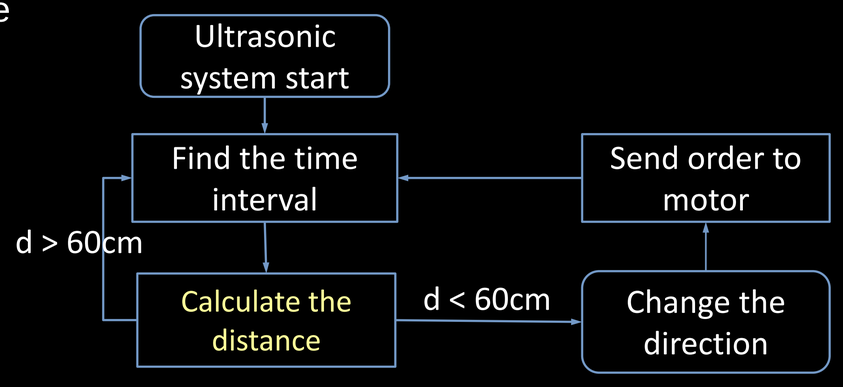
Obstacle avoidance

To sense the distance between obstacle and the car, we use the ultra-sonic sensors, HC-SR04, to calculate the distance between obstacle and M-car. It uses the duration of high level between trig and echo to measure the distance. If Arduino receive low-level signal, it sends feedback to turn the direction of motors.

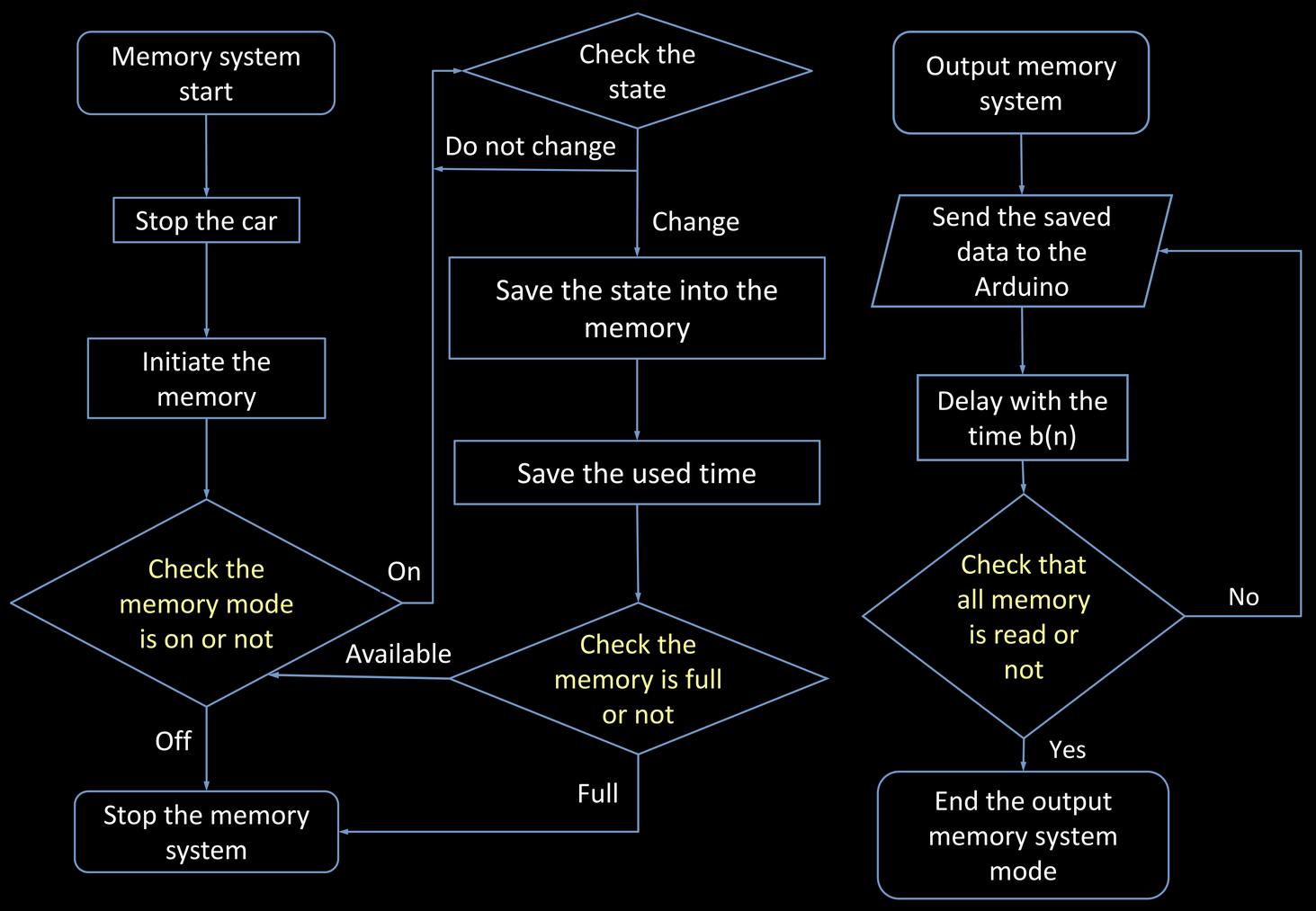
Ultrasonic sensor



Ultrasonic system



Memory system



Conclusion

Our M-Car can work in three modes. The car can be controlled by itself without hitting the obstacle. It also can be controlled by the mobile phone, after the Bluetooth is connected. The coolest point is that M-Car can remember its route. Hence, it can follow the same route again via the memory system.

Reference

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