Obstacle Avoidance System

Digital Logic & Design

Problem Statement

- Design and prototyping implementation of an obstacle avoiding vehicle through digital logic and design techniques.

Solution

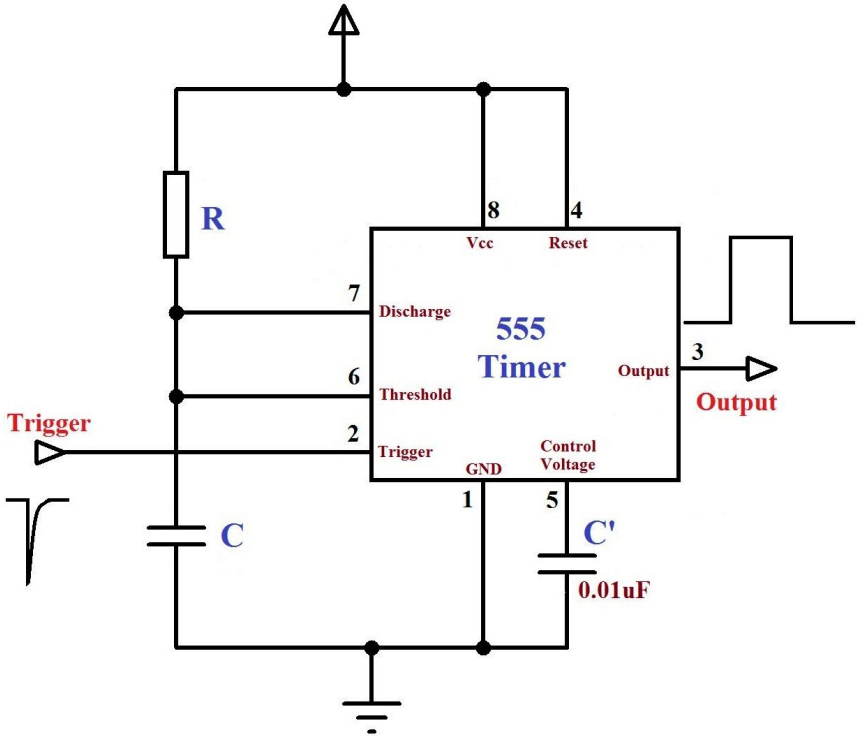
- Obstacle Detection
  - Infrared Proximity Sensor
    - Sensible Range
    - Relatively Cheap hardware
- Smooth Turning
  - 555 Timer
    - Monostable State
    - Sustains the obstacle detected logic

Infrared Proximity Sensor

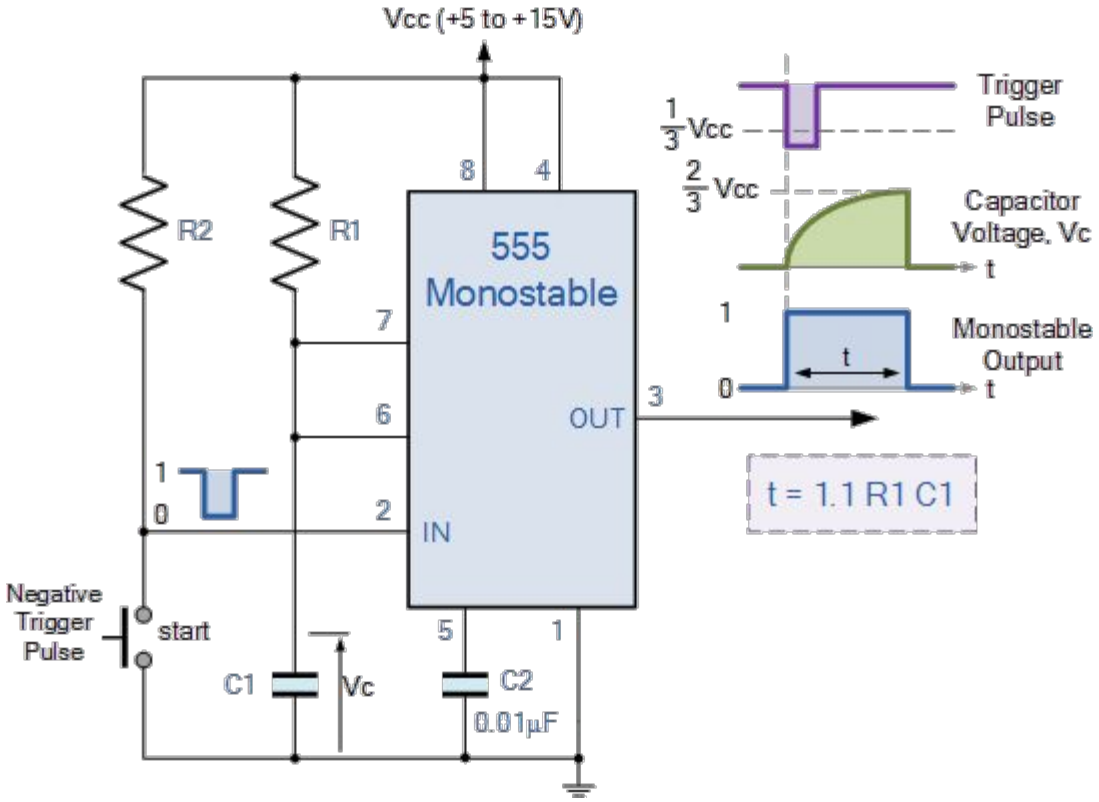
- Working Principle
  - Transmit Infrared Light
  - Detect it using Photodiode
  - Compare through Comparator against a predefined intensity level
- Range
  - 5 cm to 30 cm

555 Timer

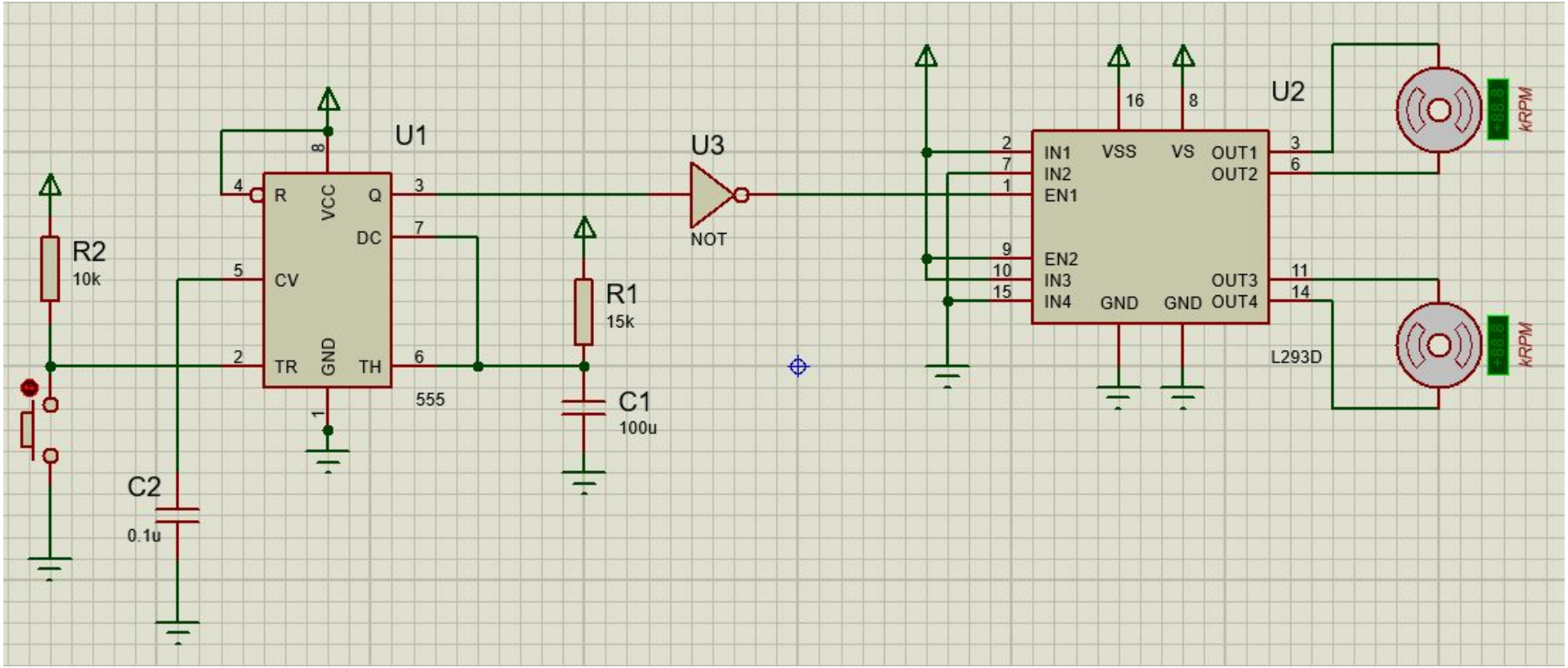
- Monostable State
  - The output voltage turns high for a set duration when a falling edge is detected
- Smoothens the turn



Circuit Design



Circuit Design (contd.)



Issues

- Power the mobile circuitry
- Understanding timer technology
- Scaling time according to requirement

Applications

- Line Following Transportation Safety
- Safety override for SLAM technologies
- Advanced form of this technique can even be implemented in Self-Driving Cars as well

Further Recommendations

- This project can be extended as a safety override for remotely controlled mobile IoT architectures. It will promote care-free environment for product damage.