

# Work Algorithm



# Design Control System for Robot Similar to **TurtleBot**



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# Contents

- 1 The Aim**
- 2 The Technique**
- 3 How to use The Technique**
- 4 Stages of work**



# The Aim

The Aim is to Design a control system for TurtleBot by using Arduino uno, similar to that in Rose operation system.



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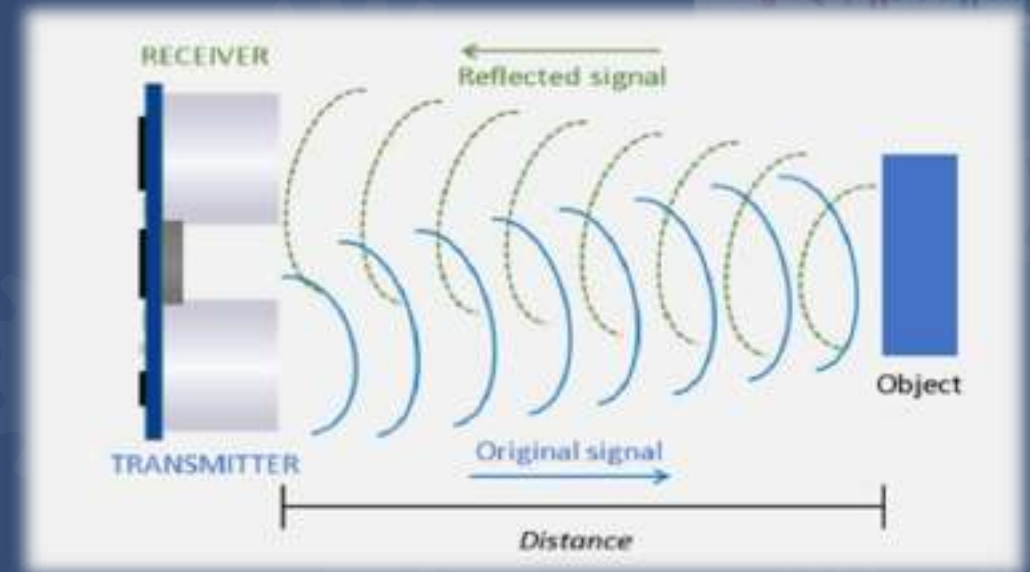
# The Technique



To make the TurtleBot robot move smarter, we will use the ultrasonic sensor.

Ultrasonic Sensors measure the distance to the target by measuring the time between the emission and reception.

This will help us avoid hitting the objects



# How to use The Technique

We will use DC motors with encoder to find out the number revolution per minute RPM, for that we should knowing the number of pulses per revolution PPR from Specification:

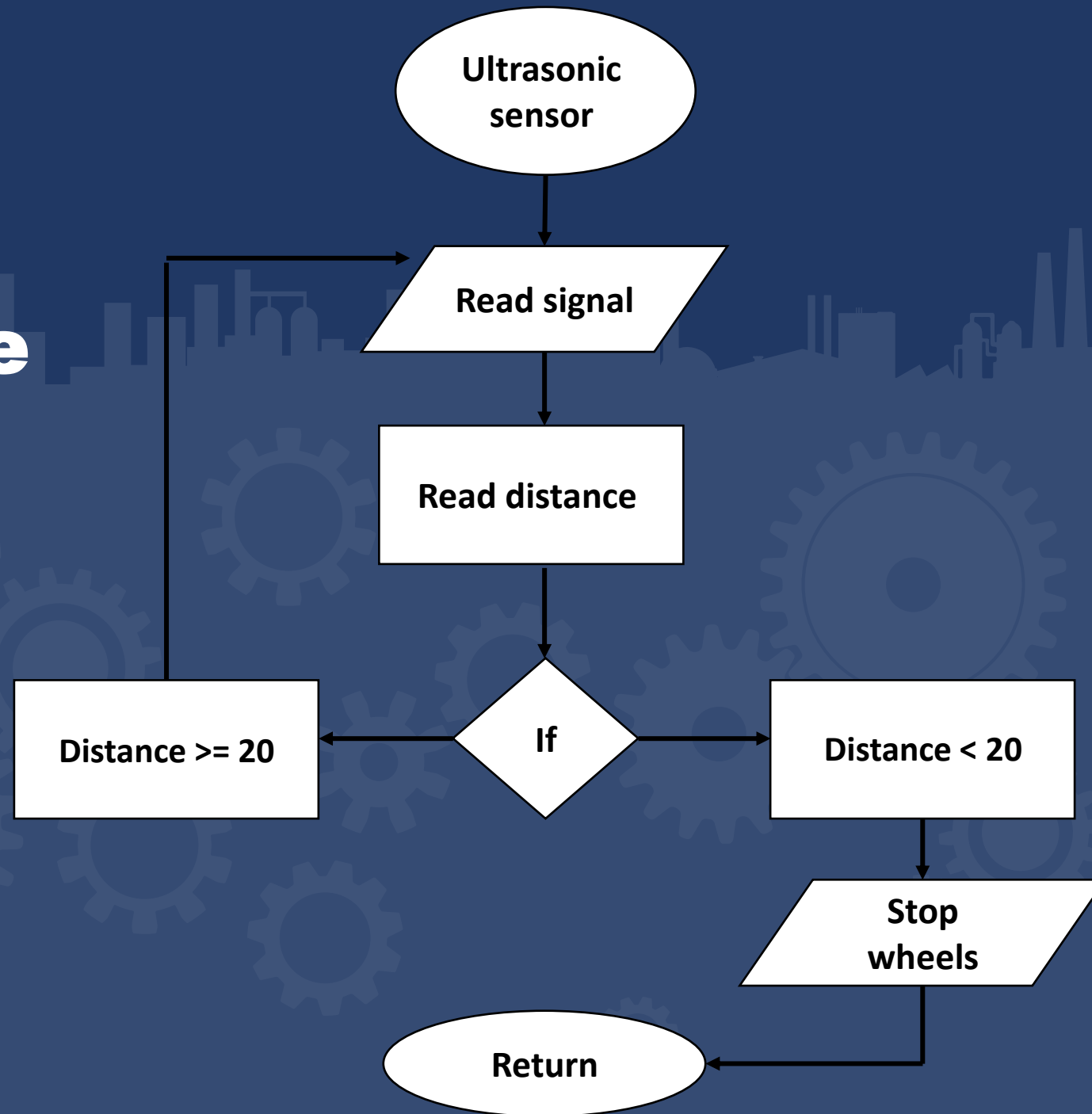
$$RPM = \frac{PPS}{PPR} * 60$$

\* PPS = NO. of Pulses per second

Hall Resolution	11PPR X i34.02 = 374.22PPR
Reduction Ratio	1 : 34.02



# How to use The Technique



مركز الأبحاث  
في الذكاء الاصطناعي



# How to use The Technique



# Stages of work

- To start with, we should buy two DC motors with encoder and ultrasonic sensor
- We will also need a transistor and a motor driver - H-Bridge
- We will be programing the ultrasonic sensor and wheels with the Arduino and insert them into a loop
- We place an if condition, where if the distance of ultrasonic 20 greater than , the first and second wheels will move clockwise automatically, and the RPM will be printed using the serial monitor.
- Else the distance in the ultrasonic is less than 20, the first wheels will stop and move counterclockwise, while second wheel will rotate clockwise, and the RPM will be printed using the serial monitor.





# Opinion

If you want to make the wheels go to specific distance and avoid hitting the objects

We can do it by knowing the how many pulses, will use an equation and adding it to the loop and knowing the wheel diameter and the PPR from Specification:

$$\text{Wheel revolution} = \pi * \text{Wheel Diameter}$$

$$\text{Pulses} = \frac{\text{Distnce you want} * \text{PPR}}{\text{wheel Revolution}}$$

Hall Resolution	11PPR X i34.02 = 374.22PPR
Reduction Ratio	1 : 34.02

