Department of Electronic and Telecommunication Engineering, University of Moratuwa

EN2532 Robot Design and Competition

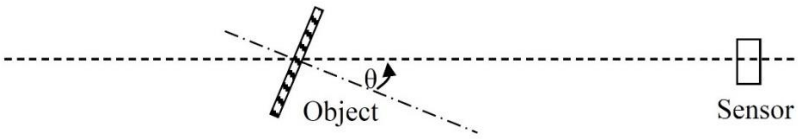
Laboratory Sheet-Practical No: 4

Indexes:	220399B, 220619D, 220491B, 220626V, 220592M	Date:	06 / 10 / 2024
Name:	Mecharuders	Group No:	10

1. Comment on your observations of the sensor readings and how you can obtain the distance value according to the particular reading.

sensor reading is obtained in microseconds & this reading increases as we increase the distance of the object from the sensor. There is a minimum & max. distance that could be measured by this sensor.
distance value = (sensor reading / sec_to_microsecond) * (speed of sound/meter_to_cm) / 2.0
we divide by 2.0 because sensor reading is the time to go & come back.

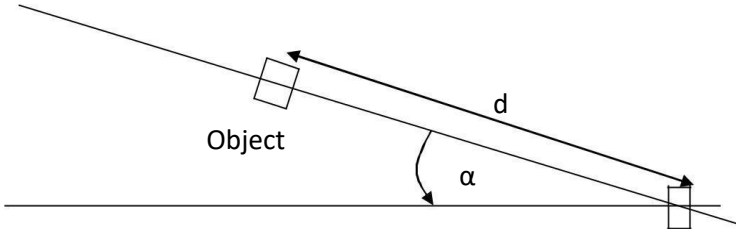
2. Place objects of different size at the same distance from the sensor and identify the minimum dimensions of the object that is detected by the sensor. even 0.75cm was detected at 100cm successfully.
3. Place a cardboard sheet at a fixed distance with different ultrasound wave incident angles (θ) with the sensor and observe the measurement. Vary θ from 0^0 to 70^0 at steps of 10^0.

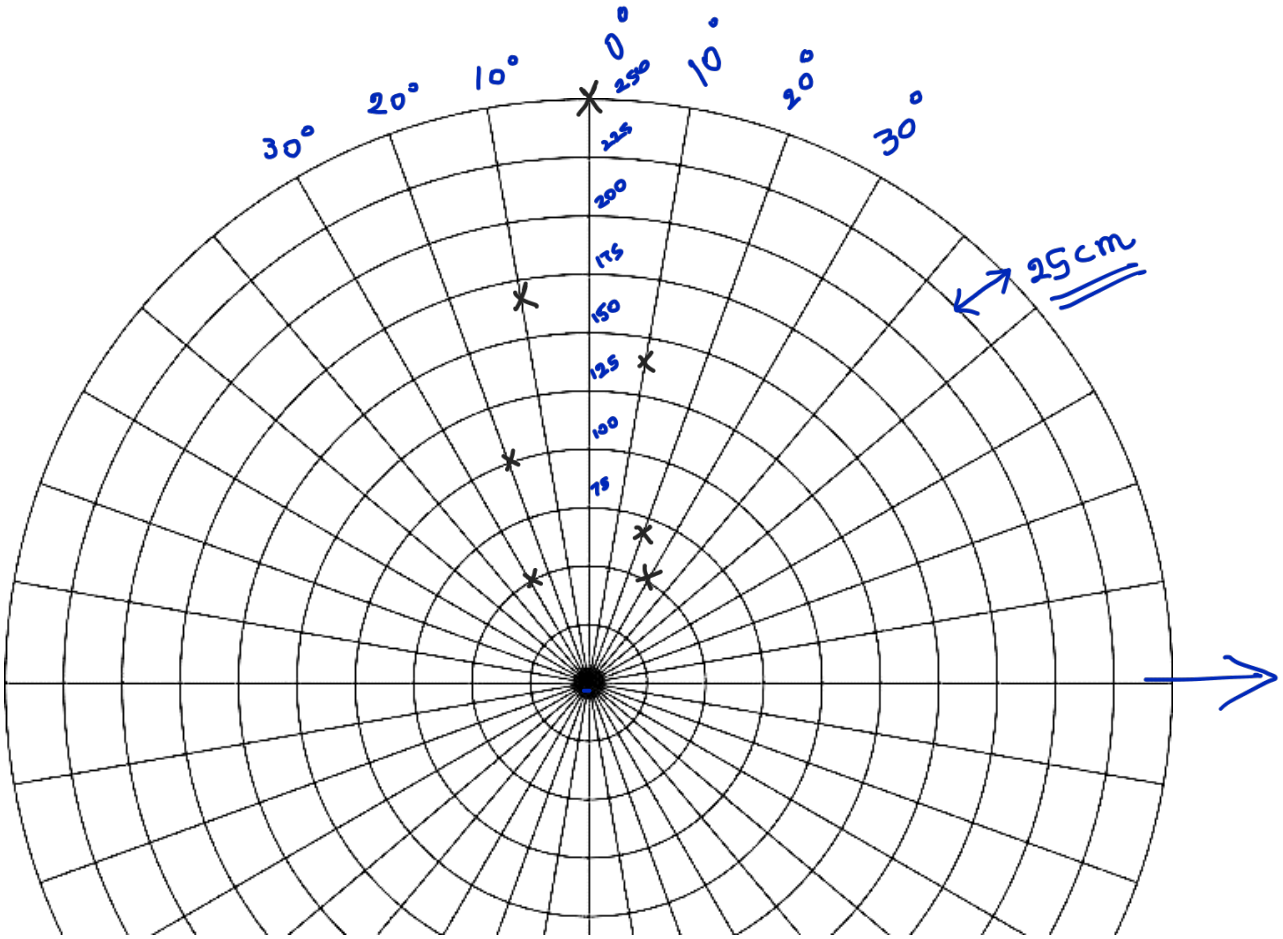


4. Comment on your observations.

The sensor wasn't very accurate here. At 35cm we were able to detect a 40° angle deviation for a 4cm strip, which was the best observation. At higher distances, even a 10° incident angle gave erreneous readings.

5. Place an object with minimum detectable dimensions. Then vary the angle from 60^0 to 0^0 in steps of 10^0 and obtain the maximum object detectable distance of the sensor for each angle and plot them in the given graph below,




0°
10°
20°
30°
10°
20°
30°
250
225
200
175
150
125
100
75
25cm