The Speed of Sound

Challenge Description, part 1

Write a program that uses feedback from the Ultrasonic Rangefinder to control your robots speed as it approaches an object. As the robot drives closer to a detectable object it should slowly decelerate and slowly come to a complete stop to avoid contact with that object. Try several mathematical formulas to optimize your robots deceleration speed.

Materials Needed

• A flat, open area for the robot to drive with a barrier at one end.

Notes

• Use the value in "SensorValue[sonarSensor]" to control the power level of the robot's motors.
• Try several mathematical variations to see which value give you the best deceleration.
  Examples: "motor[rightMotor] = SensorValue[sonarSensor] * 3
      motor[leftMotor] = SensorValue[sonarSensor] * 3" or
    "motor[rightMotor] = SensorValue[sonarSensor] / 2
      motor[leftMotor] = SensorValue[sonarSensor] / 2"

For each method that you tried, how close did your robot actually get to objects and surfaces before it stopped driving?

For each method that you tried, did the motors actually stop at that point, or was power still being sent to the motors?

Describe in detail the effect that the different mathematical formulas had on the robots deceleration. Is this what you expected would happen?

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Challenge Description, part 2

You robot now stops to avoid contact with an object.

Create a new program for each of the following behaviors:
1. If the object is removed or the robot is placed in another location the robot will resume driving at full power.
2. Have the robot drive towards the object and begin to decelerate, after the robot comes to a stop have back up, turn, and begin driving again until it reaches another object.
3. Have the robot drive towards the object and begin to decelerate, after the robot comes to a stop have the robot back up and then turn a random number of degrees and then begin to drive forward until it reachers another object.

Materials Needed
- A flat, open area for the robot to drive
- 1 Detectable object (soda cans and books work)