

Sensor Specification

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Abstract

Details of various sensors that could be used to detect nearby objects and justification for which is chosen.

The main purpose is to focus towards reactive systems as they are faster and should enable the robot to stay in motion for longer periods of time, as opposed to sitting still and scanning its environment before deciding what to do.

1 Advantages and disadvantages

There are several different types of sensors that can be used to determine whether or not there is an object in proximity.

1.1 Ultrasound

1.2 Infrared

There are two types of infrared sensors. The first type is binary and indicated if there is an object in proximity, but with no more precision than that.

The second type is analogue, this type's output will be multiple bit. An analogue output is good for determining the sensor's distance from an object in proximity. The main downside of infrared is direct sunlight or just ambient light. As the sensor emits infrared and measures how much comes back, extra infrared sources can disrupt the reading giving inaccurate values.

The Sharp IR Range Finder modules I have found which seem to be the most suitable for this type of project due to the fact that they appear to work well even in well lit areas. These sensors work by triangulation. They emit a pulse of IR and measure the angle that it comes back at (if it comes back at all), this is what determines the distance from the object.

Another downside of this is that it can produce different readings for objects that are the same distance away based on the material or even the colour of the reflecting surface.

1.3 Camera

2 Comparison based on project needs

2.1 Accuracy

2.2 Power

2.3 Processing