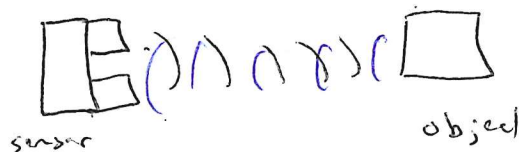


Proximity Sensing

- ① contact - button, simple
 - ↳ most likely sufficient for this course
- ② distance sensors (reflective)
 - ↳ topic of today's lecture

Distance sensors

- emits a reference signal (IR, laser, ultrasonic, etc) and measures return signal
 - intensity of return
 - time of flight
- Important considerations
 - Resolution: min change in distance the sensor can detect
 - Update Rate: readings per second
 - Range: distance min to max for accurate readings

Interfacing: Type of connection, how many pins
 I2C is two pins no matter how many sensors
 SPI is a pin per device
 Analog?

Technologies

- ① LEDs → we use here
 - good resolution
 - cheap
 - small
 - interfacing
 - high current consumption
 - low max range

- ② LIDAR - laser strikes
 - excellent max range / resolution
 - very fast update rate
 - expensive
 - high current draw
- ③ ultrasonic - sound
 - low current draw
 - multiple interface options
 - low resolution
 - slow refresh
 - relatively low max range

- Each of these is 1D in this sense
 - ↳ can get 2D or 3D for some sensors (LIDAR)
 - ↳ FOV is limited on these sensors
 - ↳ might need another option if we want to detect actual objects and not "obstacles"
 - ↳ can make a 1D sensor 2D by mounting to rotational position control and data processing

DEX: connect IR sensor to power supply and multimeter and get distance measurements
 ↳ use data sheet, 5V

- 4-30 cm
- ↳ perform experiments to get approx conversion between voltage and distance
- ↳ connect to µC and test if you have time