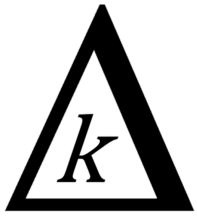
Sense Management



The robot has 2 main sensors installed: an ultrasonic distance sensor and a button.
The **button** is used to start the program. The **ultrasonic sensor** is the primary sensor for navigation. Using a single primary sensor simplifies the program and makes the design more compact.
The ultrasonic sensor works by sending out a high-frequency sound wave and then listening for the echo. The time it takes for the echo to return is used to calculate the distance to an obstacle. This allows the robot to detect objects in its path and avoid collisions. The distance data from the sensor is used to control the robot's speed and steering.

Possible Improvements:

- **Improve Power Management:** While the current setup works, a battery management solution involving buck converters with more robust power circuitry could provide more stable voltage to all components, especially during periods of high motor load.
- **Add Additional Sensors:** The ultrasonic sensor is alright for obstacle avoidance, but the robot's capabilities could be expanded by adding other sensors. For example, adding lidar sensors in tandem with the front-facing camera would allow it to navigate a track with positional and color information.
- **Upgrade the Microcontroller:** For more complex tasks like advanced navigation utilizing the camera, a more powerful controller, such as an Orange Pi, could be used. This would allow for more parallel-based programming.