The Beacon

The Colorado Robotics Challenge Beacon was designed to be an accessible and functional tool for students to navigate towards the beacon. The beacon was re-designed through a five step process:

1) understanding the previous iteration
2) designing the beacon
3) building the beacon
4) understanding the code
5) testing the beacon.

Throughout this process, careful consideration was given to ensure the final beacon would be functional to its purpose, as well as improved from previous designs.

The Code

Transmit Code:
- Helps the robot attain the location of the beacon
- Does not receive anything, but sends out the direction the compass is pointing towards in degrees relative to North (0 to 360 degrees) and a signal strength (RSSI Value)
- Beacon must be rotating for transmitter to send values

Receive Code:
- Determines the direction the robot should move towards based upon the signal bearing and the RSSI value it receives from the transmitter
- Does not send out anything and flips the signal bearing with the maximum RSSI value 180 degrees and displays it on the serial monitor
- The purpose of this flip is so that the robot is headed in the direction of the beacon.

Signal Strength Test Code:
- Verifies that the transmitter and the transmitter code are working properly

The Beacon Test

There are two aspects of the beacon that need to be tested to ensure the beacon will run effectively when it arrives at the competition.

Testing the Transmit Code:
- Use the signal strength test code to display the signal strength and compass bearing to ensure that it displays the correct values

Testing the Receive Code:
- Launch Arduino and look at the serial monitor
- Hold the computer and slowly walk backwards
- Record the data that is displayed in the serial monitor
- Compare this data to the data received from previous iterations of the test to confirm it matches
- If the values compare well to the previously collected data, it is an indicator that the beacon is spinning at the correct rate and has the correct electronic configuration

Acknowledgements

Sophie Orr, Hanna Galimanis, Lab Team (Erica Hung, Emma Teehan, Viven Blumofe)