OBJECT PROXIMITY/RADAR DETECTION SYSTEM

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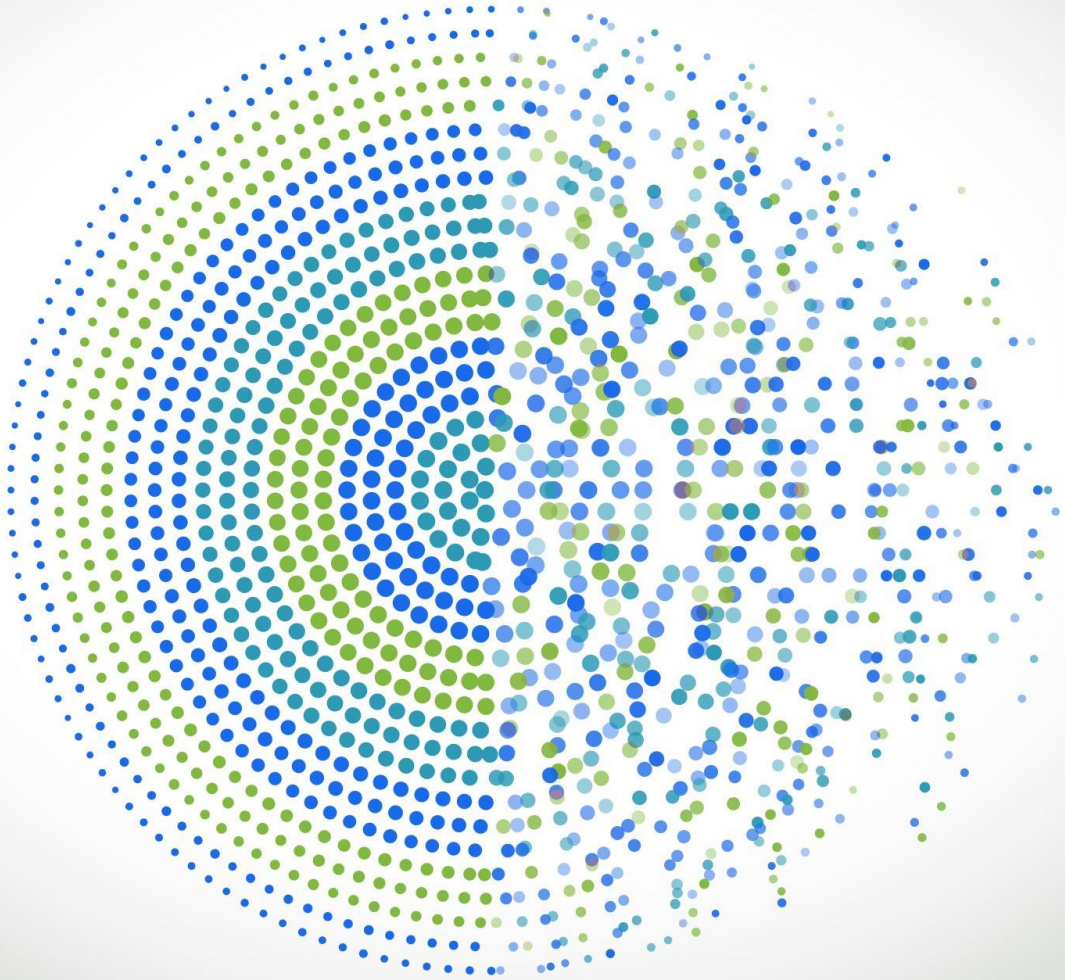


WHY

- In today’s world it has become a necessity to keep some objects at a particular distance for safety reasons
- For example, in museums generally the artifacts are either kept in an enclosed box or the tourists are enforced to keep a certain distance from the artifact
- If the person’s proximity is decreased, an alarm goes off.
- This project is made keeping in mind the low budget of implementation and ensuring that people who can come close enough can view the artifact but not too close such that it can harm the artifact or be vulnerable to stealing it.

ABOUT THE PROJECT

- This project is an object detection system that uses an ultrasonic sensor to figure out the distance of a particular object from the sensor.
- This sensor can be mounted on a servo motor with either a 180 or 360-degree rotation angle to detect the proximity of its objects in its nearby vicinity.
- If the sensor detects any objects, then the following instructions are followed:

1. Led turns red
2. The buzzer starts buzzing
3. The radar shows red in the degrees of the object

- If the object shifts/ there Is no object detected

1. Led turns green
2. The buzzer does not beep
3. The radar shows green in the degrees of the object

COMPONENTS

- Ultrasonic sensor (HC SRO4) (range 2 cm to 400 cm)
- Servo motor
- Beagle bone black
- Bread board
- Resistors
- Jump wires
- LED
- Buzzer

SET UP

To set up the entire project we plan to

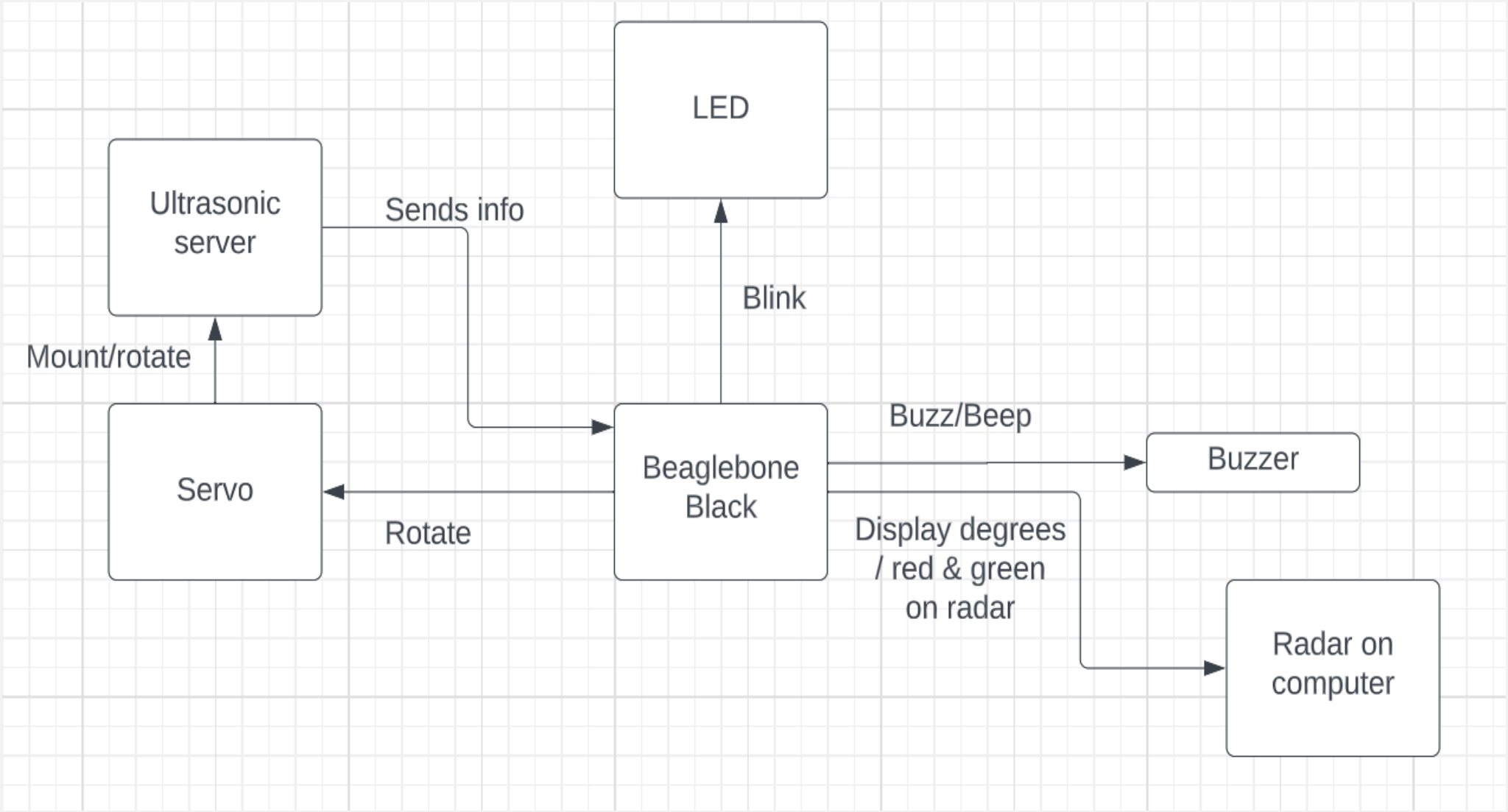
1. Connect the beagle bone to a computer
2. Connect the beagle bone to a servo motor
3. Connect the beagle bone to the ultrasonic sensor
4. Mount the ultrasonic sensor on the servo motor
5. Connect the led to beagle bone
6. Connect the buzzer to the beagle bone
7. Make sure all the components are working simultaneously together
8. Radar is being displayed on the computer

WORKING

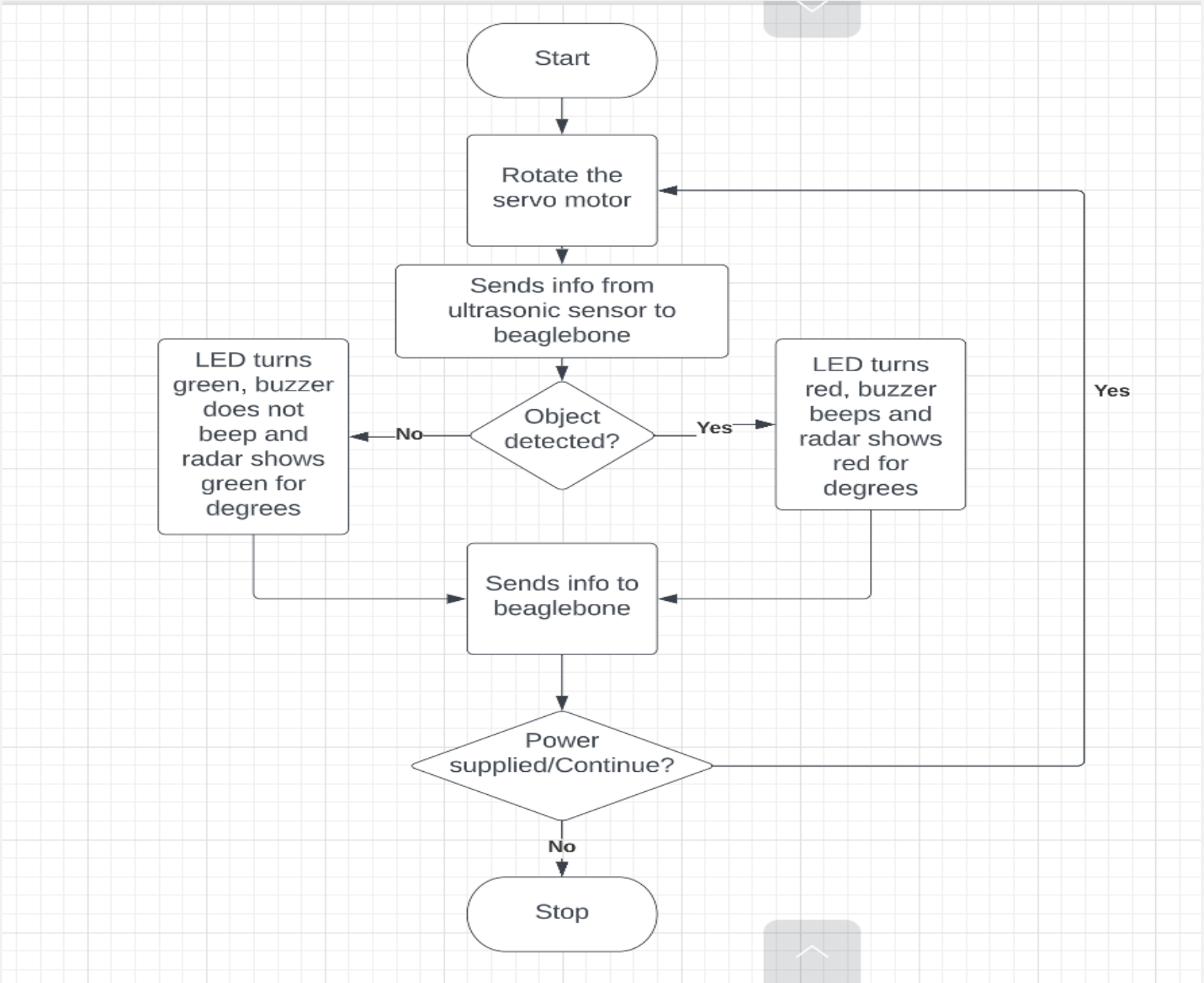
The project works in the following ways

1. The servo motor either rotates continuously 180 or 360 degrees
2. The ultrasonic distance sensor keeps on measuring the distance of objects as it rotates mounted on the servo motor
3. The led blinks green, the radar on the screen also displays green and there is no buzz from the buzzer until n unless the ultrasonic sensor detects an object
4. As soon as the ultrasonic sensor detects the object the led turns red the buzzer starts beeping n the degree to which the object is present starts displaying red on the monitor
5. As soon as the object shifts from the range of proximity sensor led blinks green, the radar on the screen also displays green and there is no buzz from the buzzer

DIAGRAM


LED
Ultrasonic server
Sends info
Blink
Mount/rotate
Servo
Beaglebone Black
Buzz/Beep
Buzzer
Rotate
Display degrees / red & green on radar
Radar on computer

FLOW CHART


Start
Rotate the servo motor
Sends info from ultrasonic sensor to beaglebone
Object detected?
No
Yes
LED turns green, buzzer does not beep and radar shows green for degrees
LED turns red, buzzer beeps and radar shows red for degrees
Yes
Sends info to beaglebone
Power supplied/Continue?
No
Stop

SCHEDULE FOLLOWING AGILE DEVELOPMENT

Date/Week	To do
02/13	Project proposal
02/20	Requirements and component gathering
02/27	Connect the beagle bone to a computer
03/06	Connect the beagle bone to a servo motor
03/13	Connect the beagle bone to the ultrasonic sensor
03/20	Mount the ultrasonic sensor on the servo motor
03/27	Connect the led to beagle bone, Connect the buzzer to the beagle bone
04/03	Code for the already connected components
04/10	Radar is being displayed on the computer
04/17	Make sure all the components are working simultaneously together
04/24	Final code review, bugs , glitches
05/01	Testing phase -range of sensor and accuracy and working of project
05/08	Final submission

CONCLUSION

In this Project using a beagle bone, a servomotor, and an ultrasonic sensor we will create a radar system that can detect the location and distance of any object in its radius. This method may be utilized in robotics for object identification and avoidance, as well as intrusion detection for various sizes of locations. The system's range is determined by the type of ultrasonic sensor that is employed. The sensor we plan to use is the HC-SR04, which has a range of 2 to 400 cm.

THANK YOU

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REFERENCES

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