

# A Simple Arduino Alarm System:

## A Project Proposal

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### **Introduction**

In this paper, I describe the process of building and modifying a hand gesture-controlled robot on wheels. The original project, developed by Shubham Shinganapure on hackster.io, describes and documents how to build a robot and integrates a hand motion system that controls the direction and movement of this device. [1]

### **Novel Contribution**

I aim to replicate the functionality of the original project with the addition of an ultrasonic sensor that will detect when obstacles get in the path the two-wheel robot, and it will not allow it to continue moving in that direction. To keep moving the robot, it will need to be turned in a direction where it is no longer blocked by an object, and its path forward is clear. Code modifications will be necessary to make this work, as well as new connections between the sensor and the Arduino. In case of Inspiration may be taken from Tim Gardner's project "Ultrasonic Glasses for the Blind", which uses an ultrasonic sensor to detect objects in front of it. [2]

### **Motivation**

The main motivation of this product is to learn new skills and discover the possibilities of experimenting with arduinos and electronic components. Personally, a robots are something that always fascinated me, and this project is a great time to learn how they work and all of the parts involved in the making of one. In addition to that, I am motivated to do

this project to show my friends and family of what I am capable of. I decided to add an ultrasonic sensor to the project, as a modification, because a friend of mine told me that he has many of these electronic devices, so I decided to take one and implement it in the two-wheel robot. This will save me money in materials.

## **Materials Required**

According to the project website, the following materials are required:

- Arduino UNO & Genuino UNO x1
- Arduino Nano R3 x1
- HC-05 Bluetooth Module x2
- SparkFun Triple Axis Accelerometer and Gyro Breakout - MPU-6050 x1
- DC Motor, 12 V x2
- rubber wheels x1
- Texas Instruments Dual H-Bridge motor drivers L293D x1
- 9V battery (generic) x2
- Ultrasonic transducer x1

In addition, the following materials are required:

- Soldering iron (generic)
- Solder Wire, Lead Free
- Tape, Foam
- Multitool, Screwdriver

## Milestones

If the project is kept properly on track, the following mile-stones should be met:

<b>Milestone 1</b>	<b>Nov. 05</b>	<b>All parts gathered</b>
<b>Milestone 2</b>	<b>Nov 20-22</b>	Initial assembly of the robot on wheels and the movement controller which will be attached to a glove
<b>Milestone 3</b>	<b>Nov 24</b>	Setup and beginning of programming code that will work on each individual device, the robot itself, and the controlling glove. Also, the code that will make the interaction between these two devices possible.
<b>Milestone 4</b>	<b>November 27</b>	By now, the robot should be functional, meaning that it can be controlled by the glove that will fit a hand and be controlled by a real human, using gestures. This step is to check that everything works as it should and to fix any bugs in the code or mistakes on the assembly of the two devices.
<b>Milestone 5</b>	<b>December 05</b>	Add an ultrasonic sensor that will monitor the road ahead of the robot and make it act accordingly (if there is an obstacle, to not allow the robot to move forward). New addition of code to the existing one of the robot and the glove will be implemented.

Please notice that the specified date milestones may change depending on some factors, such as any shipping delays of the materials, or any difficulties that may occur along the assembling or programming part of the project.

## **Team Roles**

This project is composed of only 1 member. I will be responsible for all of the roles of designing, assembling, and the software aspect of the controllable robot. Also, I will document each step of the roadmap for this project, as well as the final documentation of it.

## **Summary**

If this project turns out as proposed, the cheesy-poofs shall be protected and everything will be right with the world. There isn't a whole lot of time to complete this project so very realistic and conservative goals have been identified. It is best to get started right away.

[1]

<https://www.hackster.io/shubhamsuresh/how-to-make-a-gesture-control-robot-at-home-a3f4a4>

[2]

<https://www.hackster.io/gardnertech/ultrasonic-glasses-for-the-blind-142156>