SwipeSense

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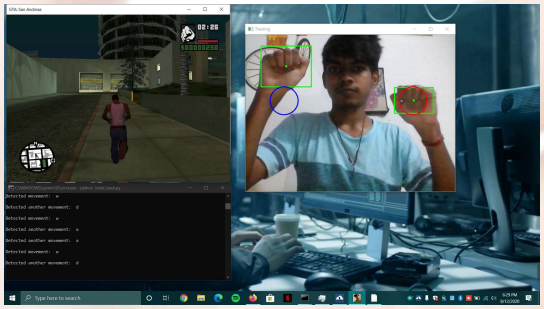
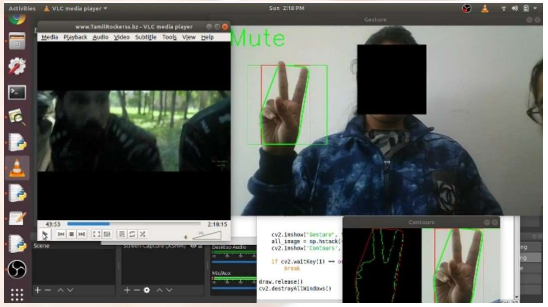
Context

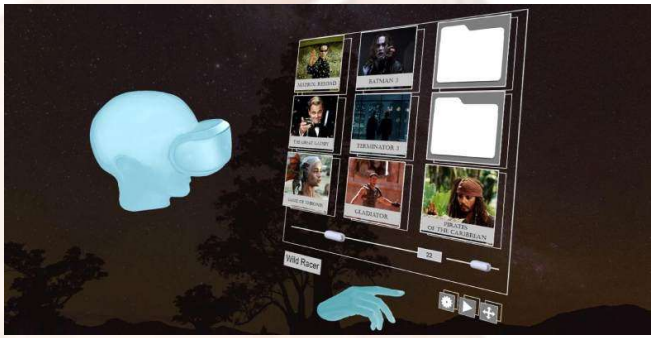
In modern technology, gesture detection and processing has been continuously used in multiple fields of interest like robotics and Machine Learning. Building a gesture detection-based control for multiple apps on windows can simplify the way you interact with your PC, be it watching movies, playing simple games or surfing the web.





Approach

We seek to build such a platform where users can enjoy gesture-based control on virtually any computer running windows with minimal hardware requirements. Such a setup can offer features like play/pause, increase/decrease volume on your favourite video player or moving between web pages on your browser with a simple swipe gesture.



Features

We offer solutions for three popular use cases:

1) Gesture based Video player control: We offer simple hand gestures to play/pause the video, seek and control volume.

2) Gesture based Game control: Control your car in you favorite racing game with hand gestures.

3) Gesture based Browser control: Move between pages like a pro with simple hand gestures. Added support for screenshots.

Gesture based Video player control

Action 1: When both the hands are placed up before the sensor at a particular far distance then the video in VLC player should Play/Pause.

Action 2: When right hand is placed up before the sensor at a particular far distance then the video should Fast Forward one step.

Action 3: When left hand is placed up before the sensor at a particular far distance then the video should Rewind one step.

Action 4: When right hand is placed up before the sensor at a particular near distance and then if moved towards the sensor the video should fast forward and if moved away the video should Rewind.

Action 5: When left hand is placed up before the sensor at a particular near distance and then if moved towards the sensor the volume of video should increase and if moved away the volume should Decrease.

Gesture based Game control

Action 1: Move your left hand closer to the screen for Left turn.

Action 2: Move your left hand away from the screen for Right turn.

Action 3: When right hand is placed up before the sensor and moved forward, car should accelerate (up).

Action 4: When right hand is placed up before the sensor and moved forward, car should stop (down).

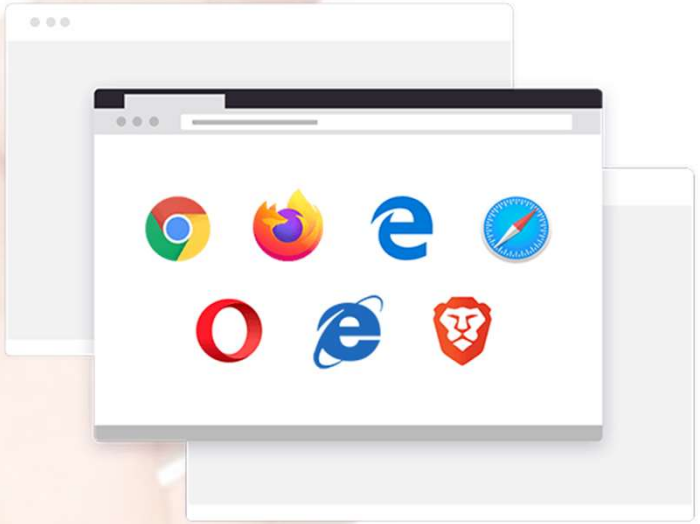
Gesture based Browser control

Action 1: Move your left hand closer to the screen for next page.

Action 2: Move your left hand away from the screen for previous page.

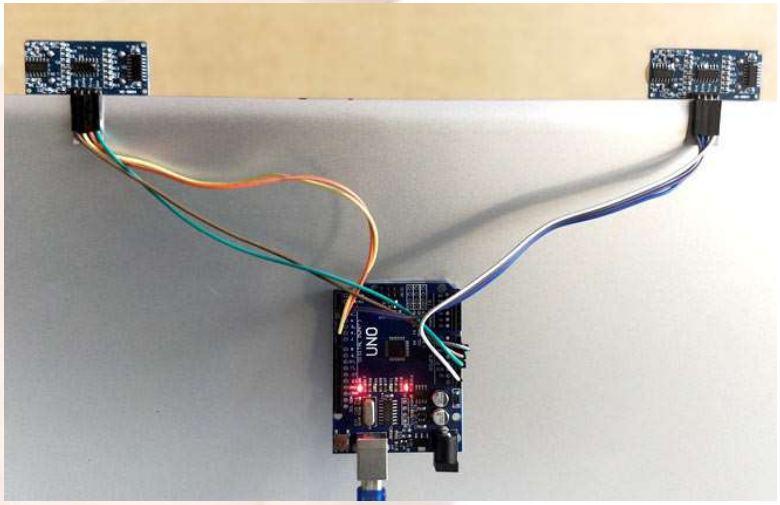
Action 3: When right hand is placed up before the sensor and moved forward, page should scroll up .

Action 4: When right hand is placed up before the sensor and moved forward, page should scroll down .

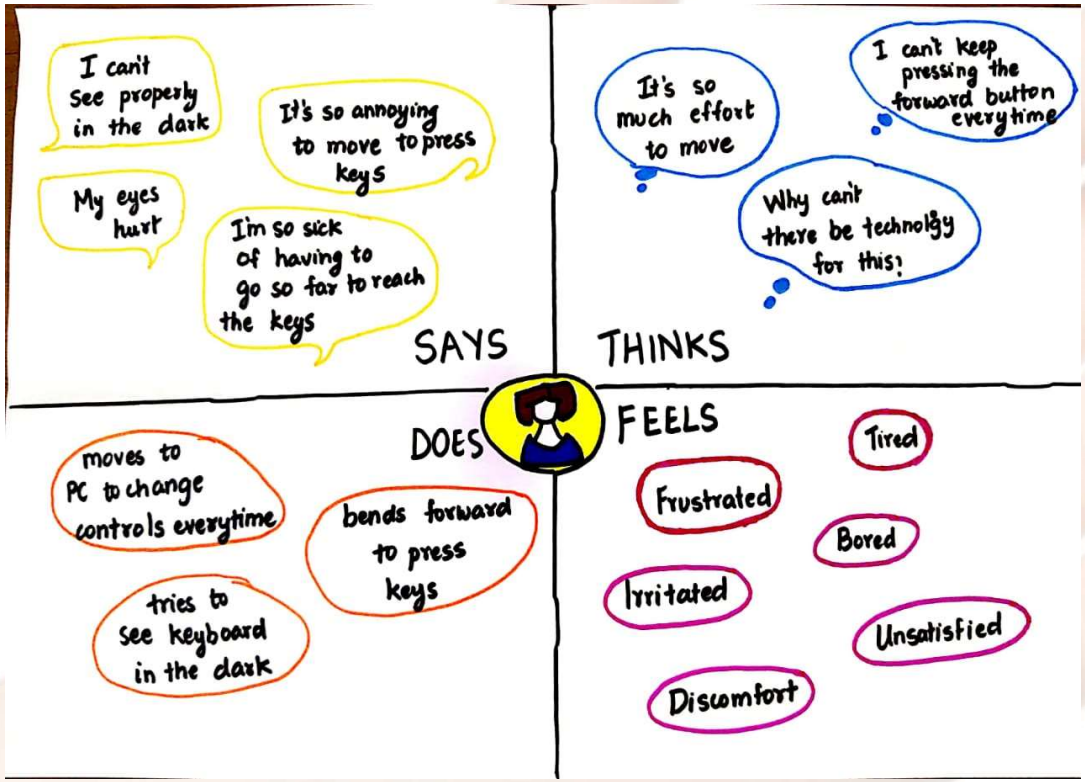


Hardware Setup

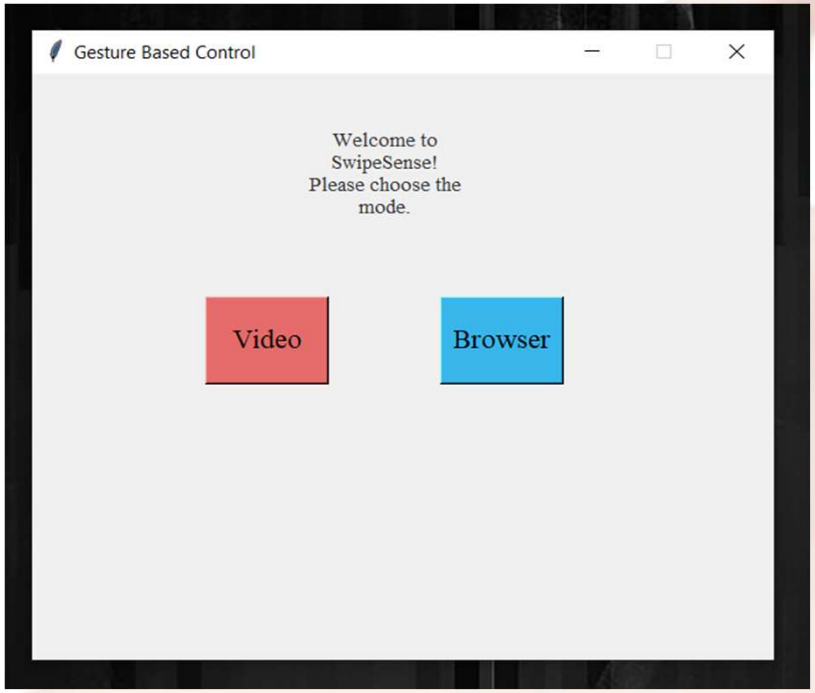
To **control the PC with Hand Gestures,** just connect the two Ultrasonic sensors with Arduino. We know US sensor work with 5V and hence they are powered by the on board Voltage regulator of Arduino. The Arduino can be connected to the PC/Laptop for powering the module and also for Serial communication. Once the connections are done place them on your monitor and run the software.

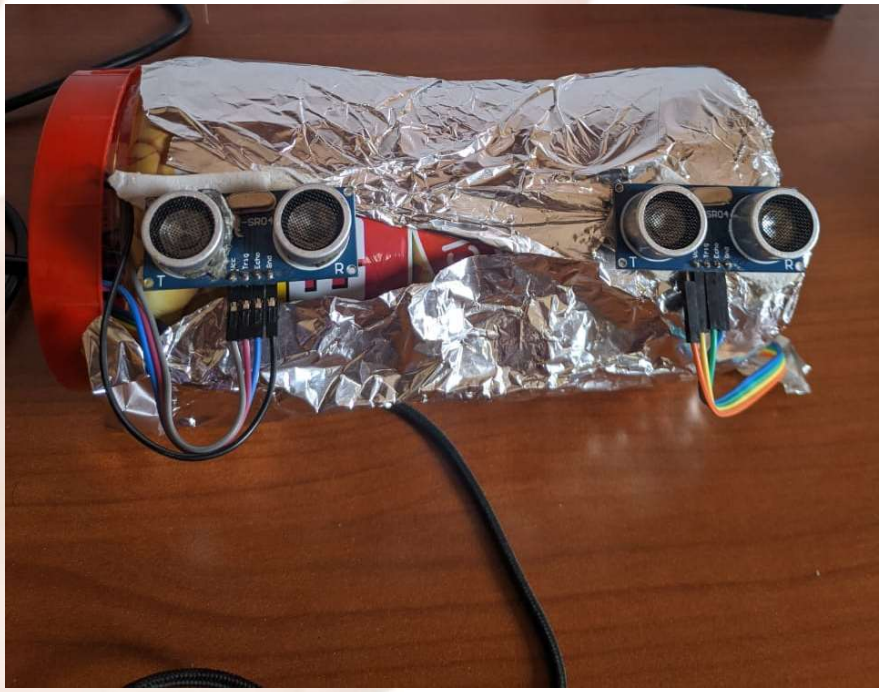


Low-Fi Prototype (Empathy Map)

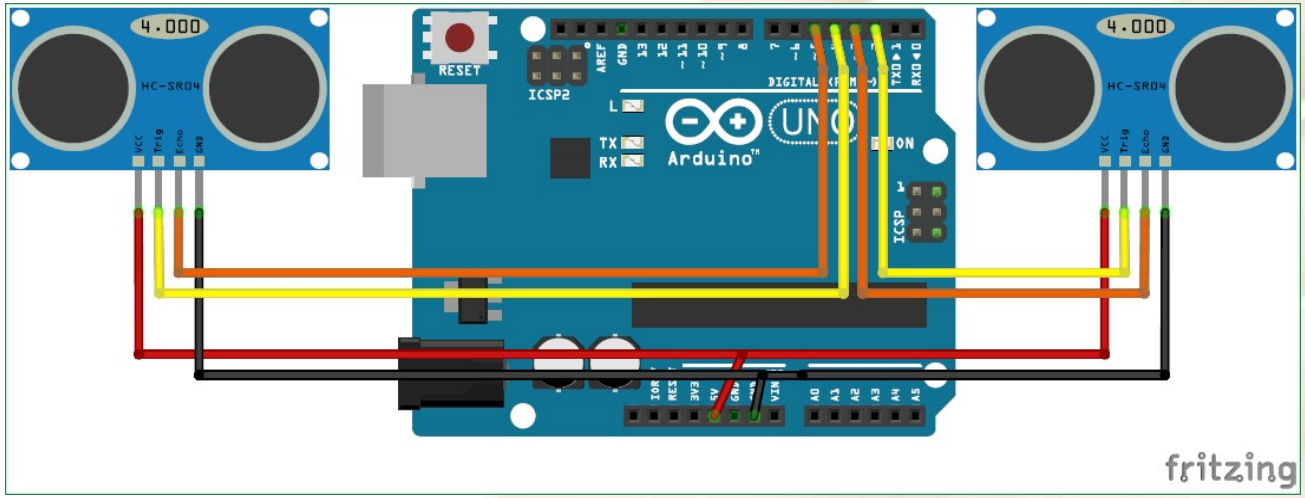


Hi-Fi Prototype





Hi-Fi Prototype



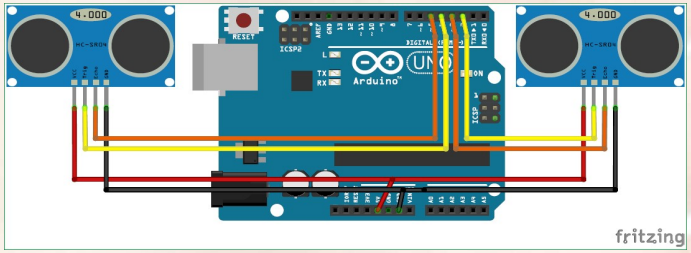
Implementation

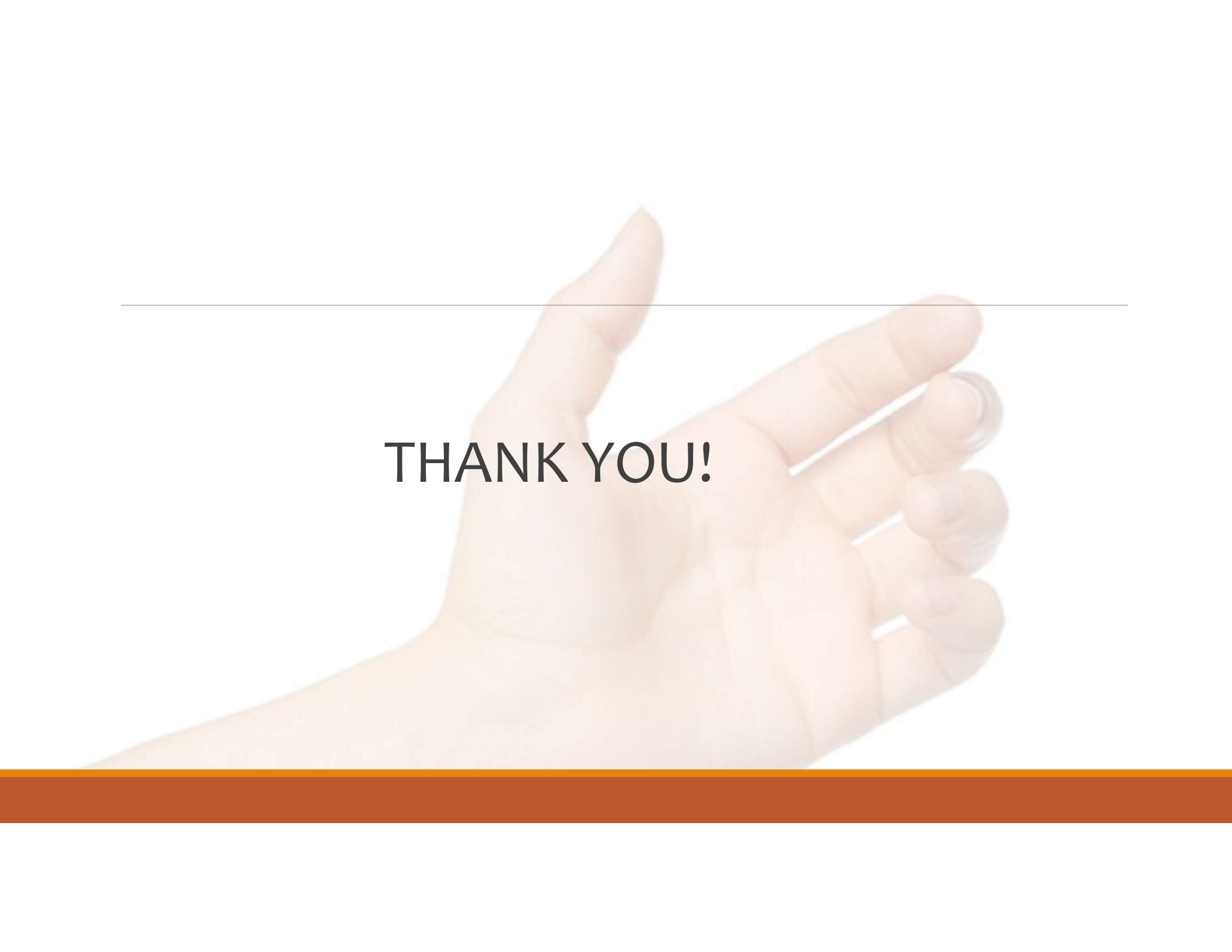
Software used:

This project was built using C++ and Python with libraries like serial, PyAutoGUI etc.

Hardware used:

Arduino Uno
HC-SR04 ultrasonic Sensor
Power Supply




THANK YOU!