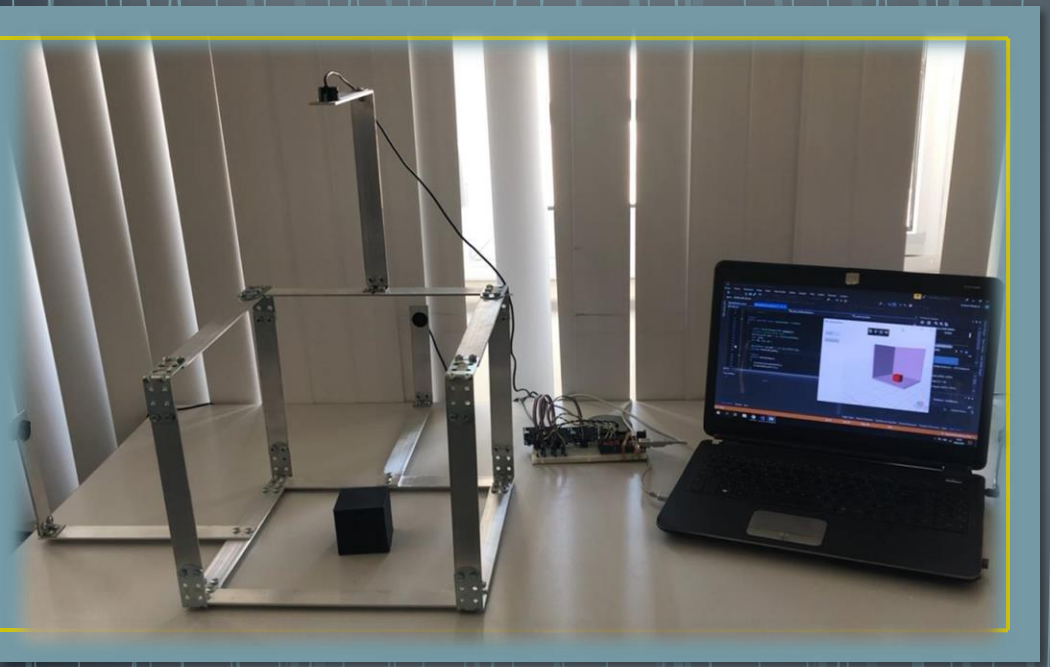
HUMAN INTERFACE DEVICE 3D POINTER



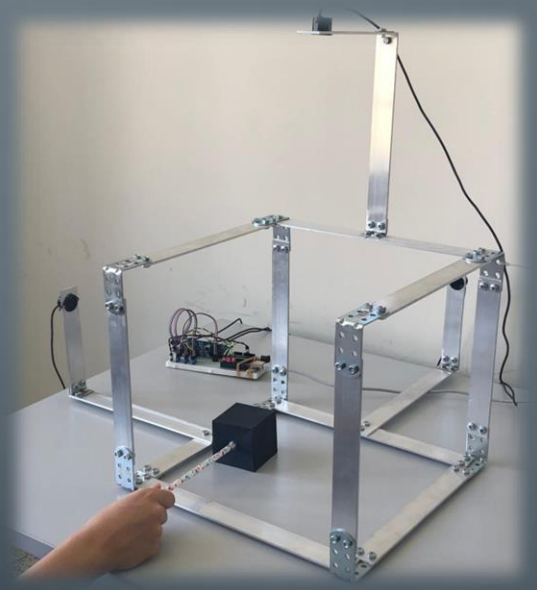
Project Members
Arzu KARATAŞ
Göktürk BİLGETÜK
Metehan Göksel KURTULAN

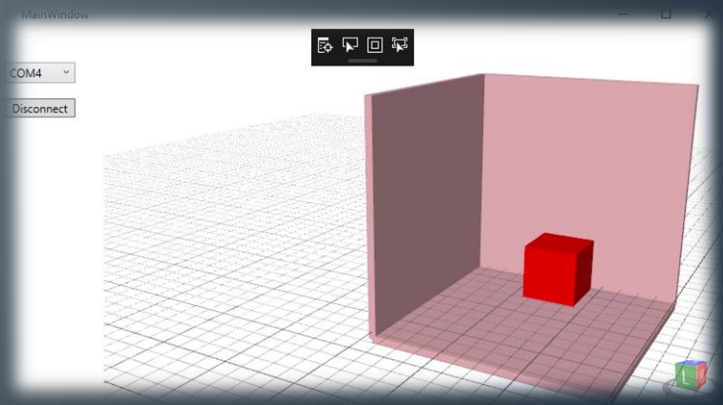
Advisor
Faris Serdar TAŞEL

CONTENTS

Human Interface Device:3D Pointer

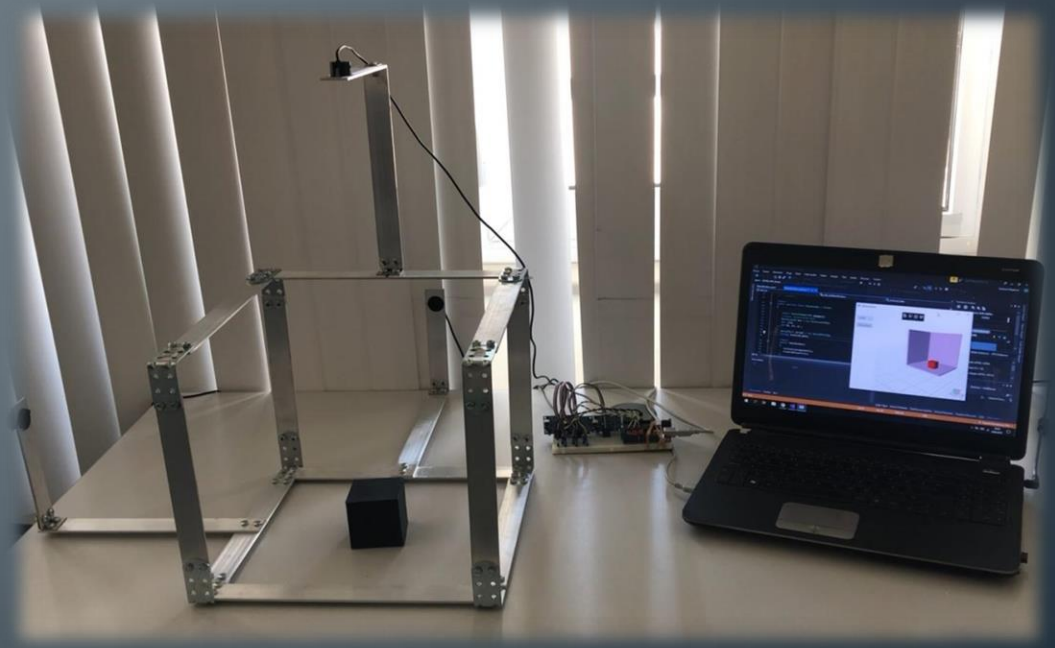
involves an API(Application Programming Interface) and hardware design of a 3D pointer device which is composed of multiple ultrasonic distance sensor connected to an Arduino device.





What is it?

Human Interface Device is a system that calculates the position data obtained with ultrasonic sensors using Arduino and visualizes them in 3D as a result of C#. The purpose of this project is to transfer the spatial data without using any receiver in general and to perform various studies on the transmitted data.

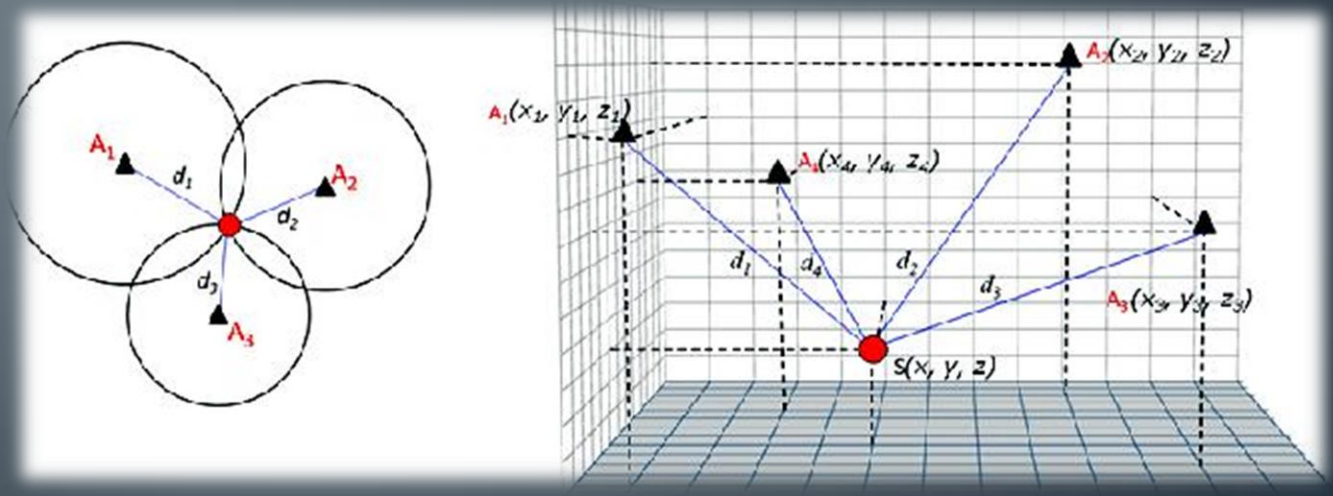


PURPOSE

1. Gathering data from multiple ultrasonic distance sensors in real time by using Arduino.
2. Computing 3D position of the pointer object.
3. Recognizing special gestures.
4. Preparing a software package comprising an API.
5. Testing the device in virtual 3D environment.

METHODOLOGY

Trilateration Methodology is the most suitable algorithm for calculating the intersection of positioning from different dimensions. In simple terms, trilateration is a mathematical technique in which a point in space is calculated using the distances from such a point.



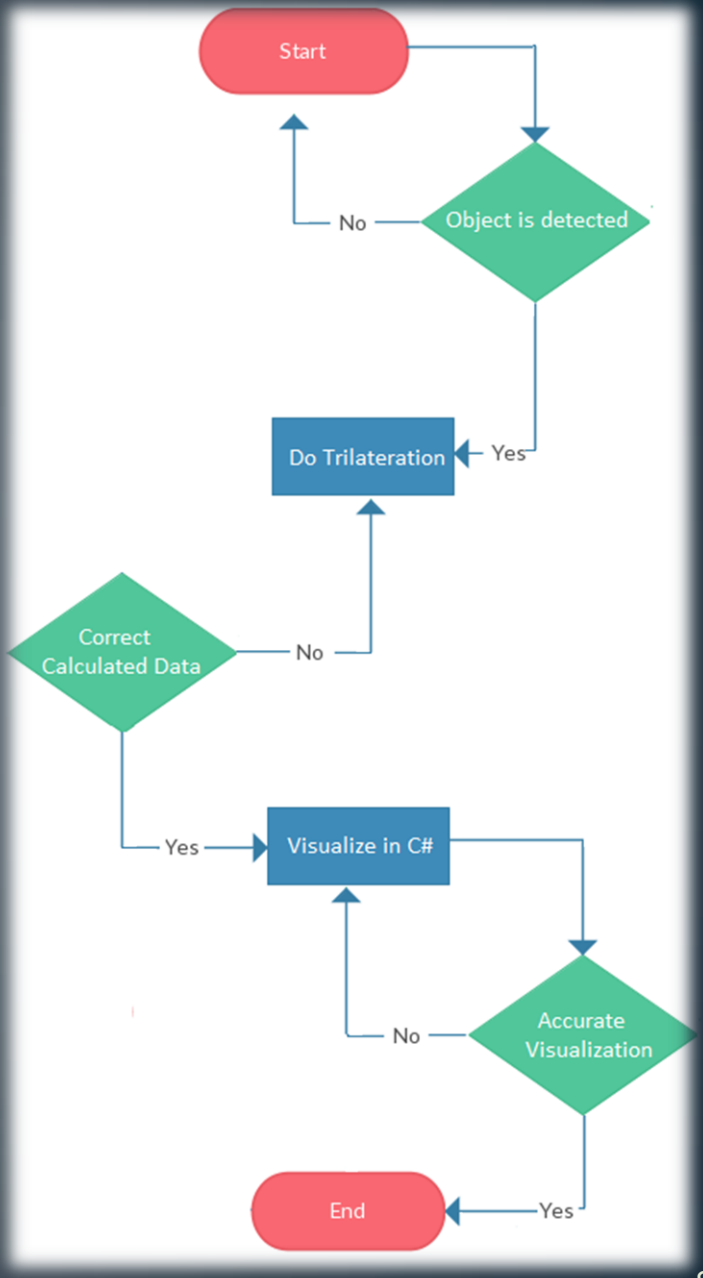
PROBLEM

The aim of this study is to transfer the spatial data in real life to the computer in 3D and visualize it in various field.

- Cost.
- Maintenance and installation.
- Usage areas.
- System sizes.
- Interaction requirements.

SOLUTION

- Ultrasonic Sensors
- Trilateration
- Arduino
- C#



RESULT AND CONCLUSION

- Some companies have developed such devices to mainly use for virtual reality and entertainment. Haptic devices are also used in industry. In this project, a cost efficient, easy-to-setup device will be designed which can be controlled by free hand.
- **Some Advantages:**
- Using 3D applications interactively.
- Ease of maintenance and installation.
- Can be used in desired sizes.
- Providing 3D input for utilization.

References

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Thanks for Listening!

Question