Glove for Deaf

G.P for Embedded Systems Diploma with Amit

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01

Introduction

Introduction

Deaf communication with non-deaf people is hard. For normal people to communicate with deaf people, they have to do one of two ways, to know their language or use the help of a person who knows in a short form a "translator".
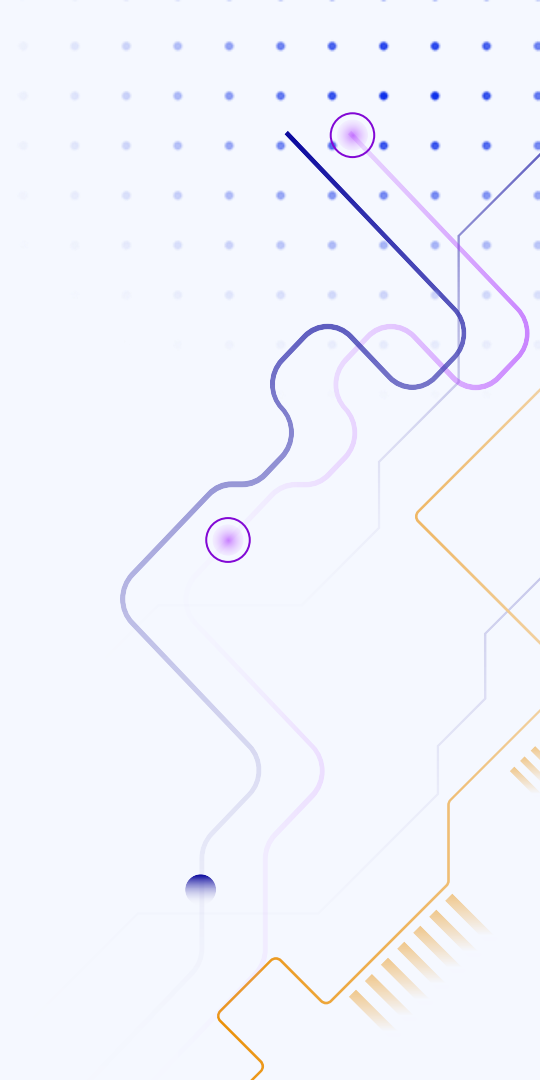
Therefore, in this project we aim to make it much easier by making a piece of equipment that the deaf can wear to auto-translate their language, which works like Google translate but with a combination of hardware.

02

Equipment

Equipment

Amit Kit

Used from it: the MC "**ATMega32**" and the LCD.

Glove

Used to hold the flex sensors on the hand.

Resistors

Used in making voltage divider with the flex sensor.

Flex Sensor

Used to identify each finger's status.

Breadboard and jumpers
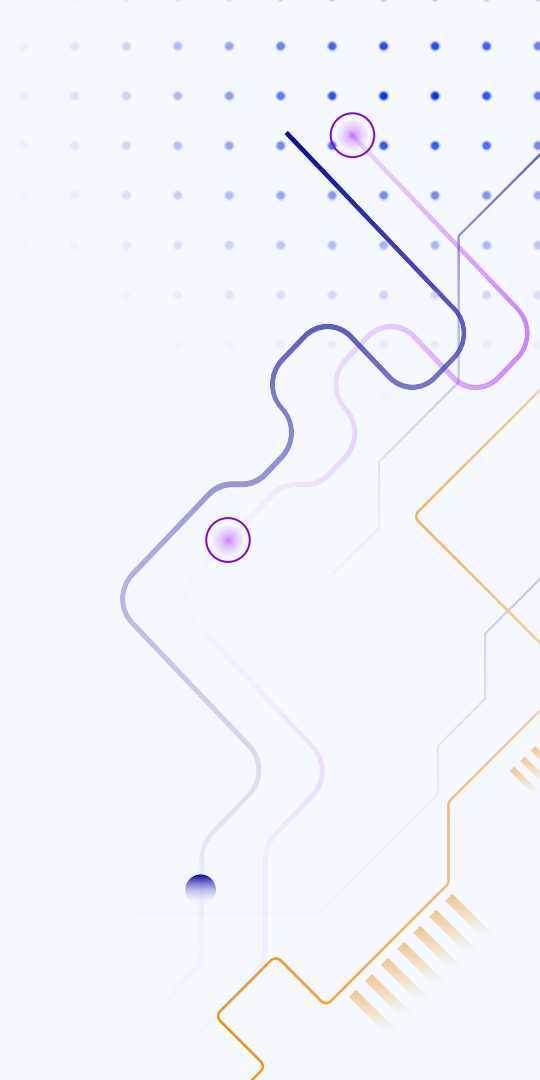
Used to connect components.

Capacitors

Used for signal filtration.

03

Process

Process Steps

3.1

Installing Sensors

3.2

Circuit

3.3

Problems and fixes

3.4

Coding

3.1 Installing Sensors

We installed each flex sensor on a different finger on a glave to help identify each finger's state and to help fix them to the hand.

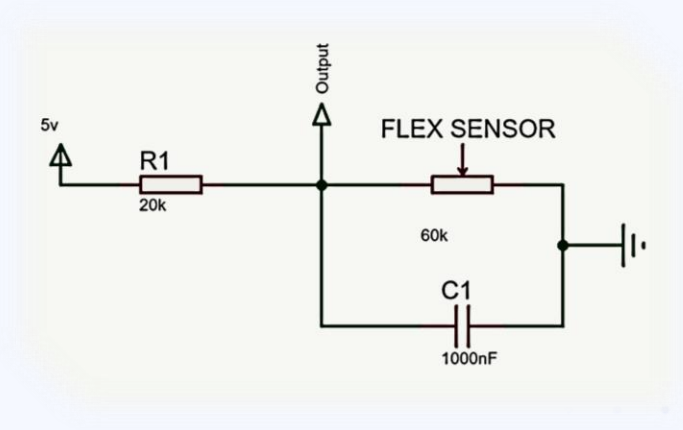**A tape was used to help fix the sensors in place.**

3.2 Circuit

$20 K\Omega$ resistor was used to make a voltage divider because the microcontroller can read voltage only.

The output analog reading was taken across the terminals of the flex sensor.

$10\ \mu F$ Capacitor was added for noise filtration.

3.3 Problems and fixes

Will connecting the analog pins to the kit, there was a shortage in the number of analog pins because ATMega32 only has 7 analog pins and in the kit 6 of them were used.

Therefore, we moved the LCD from Port A pins to Port D pins because they do not need analog pins to work and by these step, we freed 4 more analog pins.
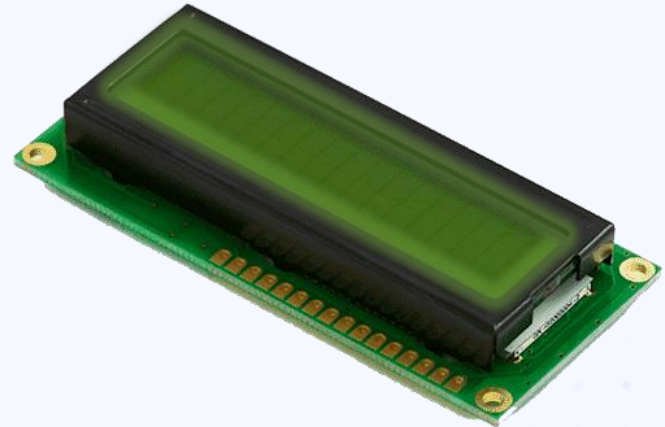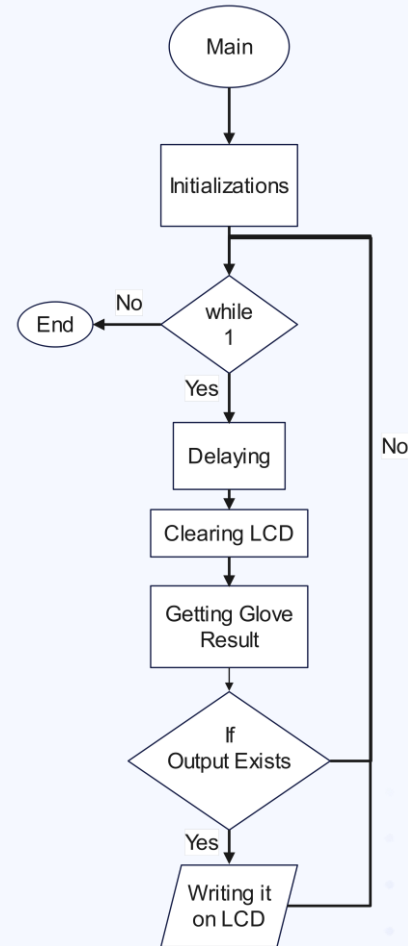
3.4
Code

Finally, we started coding.

The main was simple as shown in the flowchart.

After initializations, it gets into a loop in which it delays for about 0.25 seconds and then identifies the hand gesture, and then prints the output on the LCD then repeats the loop again.
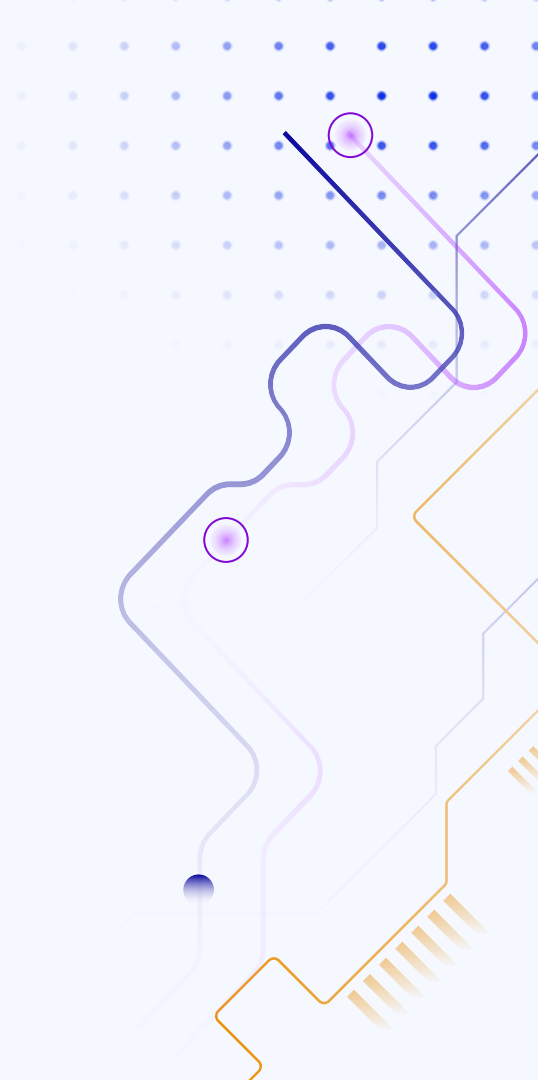
04

Conclusion

Conclusion

In the end, the project reached its destination to help understand the language of deaf people without the need to learn it or use the help of one who knows it.

The project now can translate only a few gestures.

Therefore in the future, it can be improved by adding many more gestures or even adding new sensors to measure the movement of the hand and its position which will help in understanding the gestures that depend on waving the hand.

Thank You !

GitHub Repo

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