ECE 1000 Final Report: Guitar buddy

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Ece 1000- Explorations in ECE

Group project

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*Abstract –* The guitar buddy is a 3D printed device that can play a note (g,c,d) on a guitar by a move of a joystick. We wanted to make something that allows someone who does not know how or a disability to be able to play. We were able to get the servos to rotate and press down the lever to be able to play the notes.

1. Introduction.

The reason why we chose this project is so we could make something that gives someone the ability to play the guitar. This could give a good experience to get someone into music. As someone who can not play the guitar it was cool to be able to strum the guitar and play a note without having to do anything. In our group there is Parker Branson (Electrical and Computer Engineering), Brandon Price (Electrical and Computer Engineering), Brady Harkleroad (Electrical and Computer Engineering)

1. Background

For our designs we got our 3D print online and just made some changes to it so we could mount our servos on them. Here is the link to the 3D print. <https://www.thingiverse.com/thing:4544167>

We also got some help with our code from

From or TA in ECE 1000 JC Williams. <https://github.com/JCWilliams1003/ECE-1000-Spring-2024-Final-Project-Insert-Project-Name/blob/main/Example%20Micropython%20Codes/ECE_1000_Joystick_Servo_Example.py>. This is his get hub where he has his code.

1. Project Description and Formulation

We have a Pico that has a joystick and three servos. The servo has an orange wire that is plugged into pin 0 with is the joystick detector. The red wire is plugged into the 5v power supply. The yellow wire is plugged into the ground. On our switch has a green wire plugged into pin 16. Pin 16 is the Switch detector. Also, the switch has an orange wire that is plugged into pin 26. Pin 26 allows the code to detect the joysticks movement on the x axis. The red wire on the switch is plugged into the ground. Finaly the yellow wire is plugged into the 3v power supply. In the code (given by JC our TA in ECE 1000) our joystick has two potentiometers that will put out a voltage depending on where the joystick is moved. We had our pines declared which what was described above. So we connected the x direction that is a 1 and when pressed becomes a 0. Which give us the up and down motion to press on the guitar buddy and let go.

A machine with wires and wires

Description automatically generated

A diagram of a computer program

Description automatically generated

1. Discussion and Results

We were able to get it to work and to be able to play the sounds. If we were able to continue to work on the project, there are some changes that I would suggest. First thing is to improve our 3d design. It was not completely perfect. The Second thing is to be able to have more joy sticks, so we don’t have to unplug from each servo. We enjoyed the process of getting it to work. We had some trouble getting all the servos on. So, we had to come up with clever ways to get it all on. Then when we finally got it. We all got excited. We worked collectively together on the project. The main thing Parker Branson and Brady Harkleroad worked on was making the improvement to the 3d design. Brandon Price worked on the code. We all worked on putting the parts together to get it working.

1. Conclusion

We wanted to be able to make something that someone with no experience could play a note on the guitar. We were able to accomplish that and we able to acquire problem solving skills, some python code, and how to use a Pico

References

Gkitt July 16th, 2020, Guitar Simplifier, thingverse,

<https://www.thingiverse.com/thing:4544167>

JCWilliams1003, April 15th, 2024, ECE\_1000\_Joystick\_Servo\_Example.py,

<https://github.com/JCWilliams1003/ECE-1000-Spring-2024-Final-Project-Insert-Project-Name/>blob/main/Example%20Micropython%20Codes/ECE\_1000\_Joystick\_Servo\_Example.py

How does it work

We got a 3d print and it has 3 servos attached to it. We have it connected to a switch that will push down a lever and then will press down the chords. After that you can strum the guitar and it will play the chord you wanted.

We got the 3D print online. We made some edits to it. You can find the original from the link below.

Detail cost. How did it perform.

With this it did not cost that much. We had a guitar and we were able to get the 3d print from the school, and the servos. We had to get a few things at the store that cost about $11.

Why was I interested in it?

I was interested in this project because I can't play guitar well and if I could have something that could press the notes and all I had to do was strum. I am all for it. I kind of have what concentration I want to go in , but it was cool to explore this project and figuring out how to get it to work.