*ECE 1000 Final Report: Joystick Oporated Robotic Arm*

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*Abstract*—Our project is a Joystick Operated Robotic Arm. We created this for a final project for the course, Explorations in Electrical Engineering 1000. This is a fully functioning arm that can move horizontally, vertically, and includes a grabbing feature with a claw.

Keywords—Inductive Power Transfer, Wireless Power Transfer, Joule Thief, Magnet Wire, Center-Tapped

# Introduction

We chose the robotic arm for our project because it didn’t seem too complicated and rather straight forward. We are very much beginners to programing at this level, so we wanted to make sure we chose a project that would be easier to understand when it comes to function and programming. We are both ECE majors, and sophomores as well.

# Background

First, we normally begin a report by talking about what sources and literature we used to develop the project. For example, in this section you would state what articles, journals, forums, YouTube videos, or people you used to help formulate your code and overall process for the project. Please cite all your sources; plagiarism is a serious concern, and as engineers, we must always give credit where credit is due! Also, these sources might be useful for you in the future, so please make sure to note where your team drew information.

# Project Description and formulation

In this section, we talk readers through how the project works. Explain all wiring for the project (i.e. what pins are you using on the Raspberry Pi Pico and how do they connect to your sensors?) Also, attach a simple circuit diagram for your project (this can be made in LTSpice, TinkerCAD, or a block diagram software). Also, explain how your code works and why you decided to use certain methodologies. Finally, insert a picture of your full system (for the robot arm ... show the arm, the Raspberry Pi Pico, joystick, and any other materials). A blue toy with wires on a wood floor

Description automatically generated

# IV. Discussion and results

Our results show that our arm was about 70% functional. Our coding and our motors were 100% functional, we really just ran into issues with our 3D printed model. The claw wasn’t able to work due to issues with the 3D printed gear, it was larger than anticipated, which threw off the claw part of the design. We also ran into troubles attaching certain parts of the model together, some were loose. I would say that in the future we must print out a better model that accommodates the potential error that 3D printing can pose.

# V. Conclusion

In this section, we conclude the report by restating the purpose of the project, the skills acquired, and the results.

##### References

1. Thingiverse.com. “Micro Robot Arm (9G Micro Servo) See Video by Bentommye.” *Thingiverse*, www.thingiverse.com/thing:34829/remixes. Accessed 28 Apr. 2024.

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