



Project Louis

Articulated Robot Arm

Funded by Eik Lab (pretty please)

Authors

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1 Introduction

Our goal for the first iteration of the project is to create a functional proof of concept for an articulated robot arm, with a task space in \mathbb{R}^3 . We will be utilizing tools we don't yet know how to use in order to learn. These are tools that we plan to keep using for future iterations, meaning that keeping the first iteration simple for learning is key for future success. Therefore, the first iteration will be an extremely simplified model of an articulated robot arm, to the point where it might not fit the definition. However, through future iterations and learning the complexity of the project will also increase accordingly.

We want to have a transrotational joint at the base, along with a rotational joint at the start of the arm, and another at the halfway point of the arm. That way we get orientational control about the base, and positional control of the end of the arm. To accomplish this for the first iteration we will utilize servo motors for their convenient blend of functionality and ease of use. We will also have a basic gripper which will be controlled by a single servo utilizing a gear mechanism.

For actual functionality we want the arm to be able to perform basic movement controlled by an XBox controller or similar. Control the movement with the joysticks and control the gripper with a button.

2 BOM

Component	Function	Model	Reason	Amount
STM32 Microcontroller	Provides electrical signals	STM32	Functions as the "hub" of all electricity in the project. Can deliver what we need on command.	1
Single Board Computer (SBC)	Provides Computational Power	Raspberry Pi 5	Functions as the "hub" of all complex computation and mathematics in the project	1
Servo	Rotation	DS3218MG	Provides movement control	4
Breadboard	Wire hub		Provides a versatile way to prototype electrical circuits	1

3 Robot arm sketch

Witness the true artistry of Johannes Standal (Painted by hand (trackpad) using MS Paint)

4 Project links

Github