Weekly Report

Week 2

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Abstract

This report summarizes the tasks completed, challenges faced, and progress made during the past week. Additionally, it outlines the next steps and any issues that require further discussion.

1 Introduction

Over the past week, I have focused on designing and 3D printing parts of a robot arm. The goal was to create a robot arm that can be used for plastering work. This report details my progress, the challenges that I have encountered and future plans.

2 Progress and Accomplishments

- Designing the 4-axis Robot Arm: Created several key components using computer-aided design (CAD) software, primarily inspired by the ABB IRB 460 model [1] and Custom Robotic Arm [2].
- 3D Printing and Assembly: Successfully printed and assembled several parts, making adjustments to improve fit and durability.
- Servo Motor Control: Set up a basic Arduino-based control system to move the joints.

Figure 1: Partially assembled robot arm

3 Challenges and Issues

- Incomplete Design: The mechanism between the end effector and the trowel, are still under development. The lack of a complete trowel design has delayed the full assembly.
- Limited Control System: The robot arm is currently controlled via a basic Arduino setup with no user interface or inverse kinematics implementation.

4 Next Steps

- Complete the trowel design, 3D print the missing parts, and assemble the full robot arm.
- Develop a more advanced control mechanism for precise joint movement.

5 Conclusion

Significant progress has been made in designing and assembling the robot arm, but challenges remain in finalizing the end effector and improving the control system. The next steps will focus on completing the design, improving movement control, and enhancing software capabilities.

References

[1] ABB Robotics. n.d. IRB 460 Articulated Robots. Retrieved from https://new.abb.com/products/robotics/robots/articulated-robots/irb-460

[2] S. Dong, M. Muramoto, and W. Du, "A custom robotic arm simulation using RoboDK for plastering work," in Proceedings of the 2024 10th International Conference on Computing and Artificial Intelligence (ICCAI '24), 2024.