**Robotic Armchair (Recliner)**  
*(A Pick and Place Solution for Home Comfort)*

Project Report by,

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### INTRODUCTION

In an era marked by increasing automation and technological advancement, the fusion of robotics with everyday convenience has taken a remarkable advancement. This innovative project features a reclining chair with a precision-driven robotic arm for seamless pick-and-place operations. Robotic Recliner project offers a new home automation standard, enhancing comfort and convenience. Robotic Recliner represents a novel intersection of comfort and automation, where the traditional concept of relaxation is seamlessly blended with advanced robotics.

The following are some motivations which show the usefulness of a robotic recliner:

**Home automation:** For individuals seeking convenience and automation in their homes.

**Healthcare and Rehabilitation:** This system could facilitate exercises and therapy, making it a useful tool for therapists and patients.

**Elderly Care / Assistive Technology:** In scenarios where individuals have limited mobility or physical disabilities. It allows old people to be more self-reliant.

For entertainment purposes, it could offer convenience by bringing items like snacks and drinks within easy reach without the need to leave the chair.

Researchers may find it useful for experimentation and exploration of human-robot interaction.

It is crucial to consider the safety measures and user preferences when designing and implementing it.

### COMPONENTS REQUIRED

|  |  |  |
| --- | --- | --- |
|  | Equipment Required | Quantity |
| 1 | 3D Robotic ARM parts | 1 set |
| 2 | Servo Motors | 4 |
| 3 | Arduino UNO | 1 |
| 4 | Screw Driver | 1 |
| 5 | Jumper Wires | As Required |
| 6 | Receiver and its remote Controller | 1 |

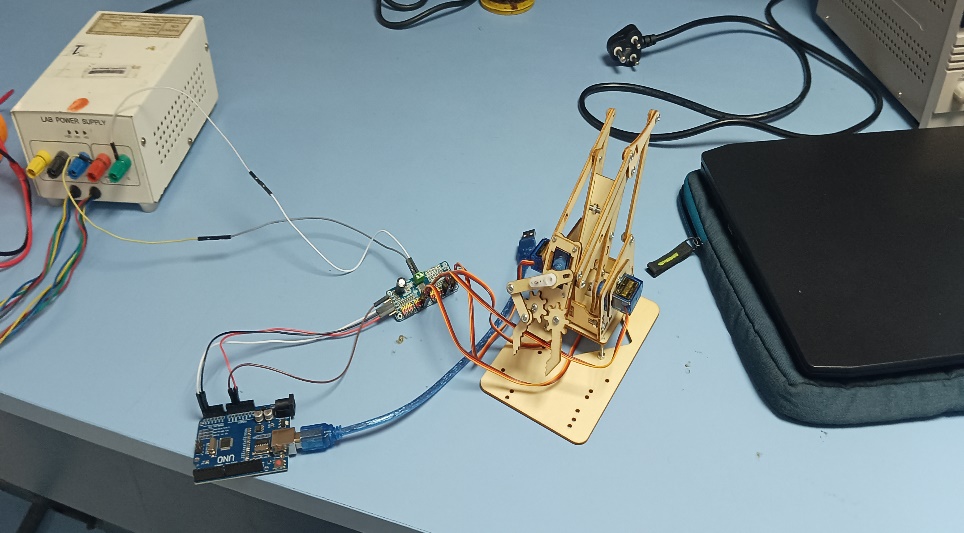
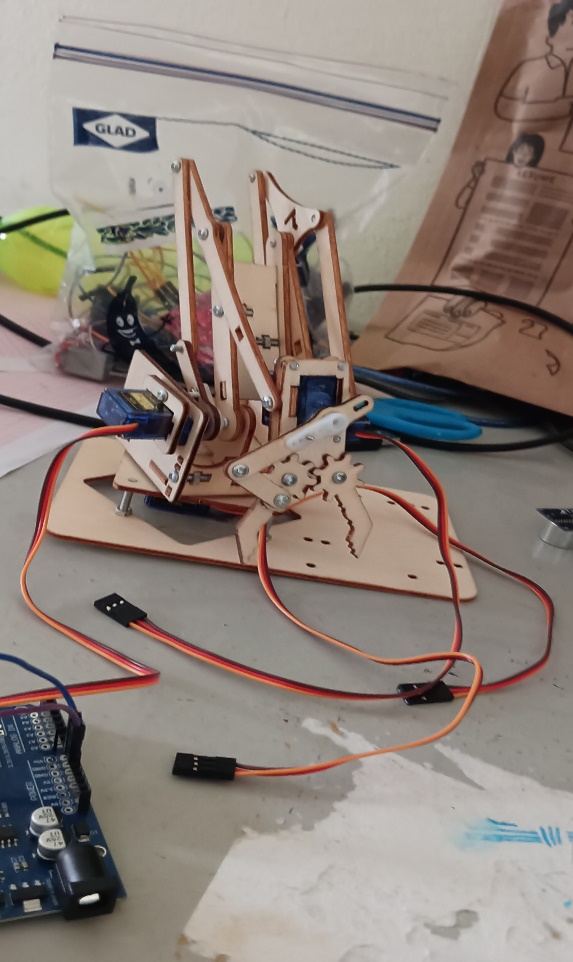
### PROCEDURE

1. Build the robotic arm using 3D model parts.
2. Include the servo at the joints wherever it is necessary.
3. Later using the Arduino digital pin method check whether all the servos are working or not concerning the robotic arm movement
4. As it is a 4 servos robotic arm, we used Arduino for the base servo, and for the remaining three we connected them to the receiver.
5. For Arduino to be ON we introduced a switch.
6. Observe robotic arm movements and actions using the remote controller.

BLOCK DIAGRAM:

#### HARDWARE PROTOTYPE and OBSERVATION

Link to observation results: https://drive.google.com/file/d/123eIWYxwkKp3f-ks-EPE-trDJtmWGzZA/view?usp=drive\_link

Conclusion:

The implementation of a robotic arm mounted on a wheelchair is a significant technological advancement that addresses the mobility and independence challenges faced by individuals with physical disabilities. This project aims to enhance the quality of life for users by providing them with a versatile and assistive tool capable of performing various tasks. Through the integration of a robotic arm with a wheelchair, users gain increased autonomy, enabling them to perform daily activities more efficiently and with greater ease.

The success of the project lies in its ability to seamlessly integrate with the wheelchair's existing controls, ensuring user-friendly operation.

The inclusion of sensors and advanced algorithms enhances the safety and precision of the robotic arm, preventing collisions and ensuring smooth navigation in various environments. User feedback and testing have played a crucial role in refining the system, making it more intuitive and adaptable to individual needs.

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