Gesture Guide

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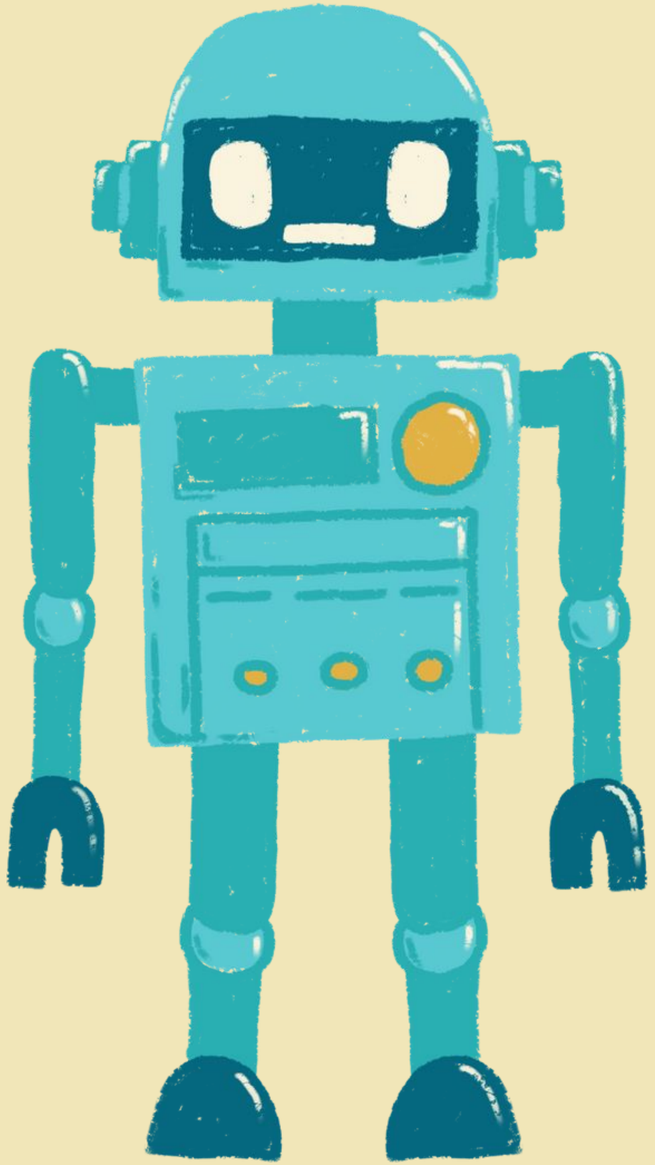

Team Members

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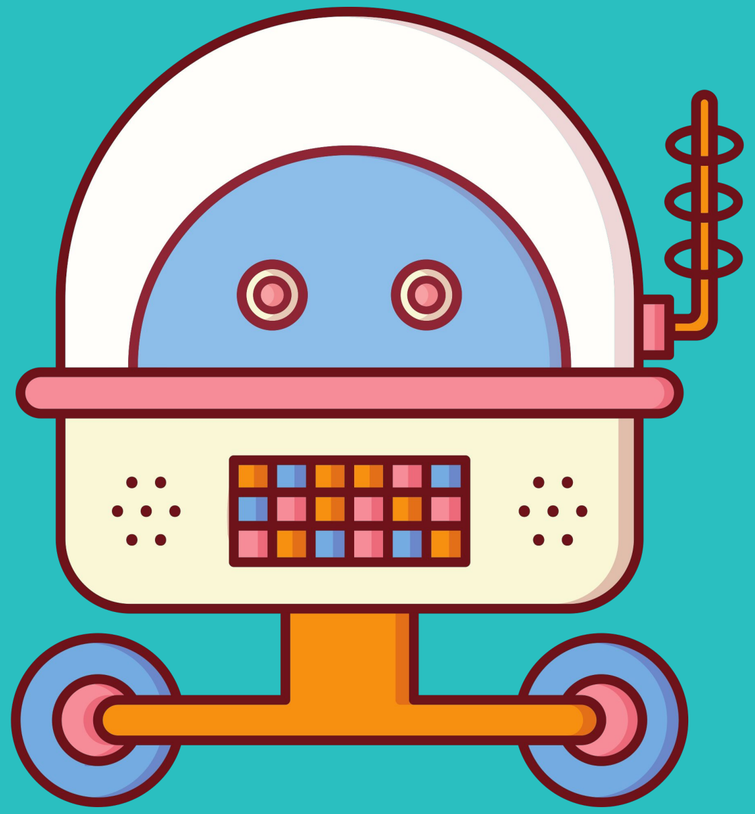

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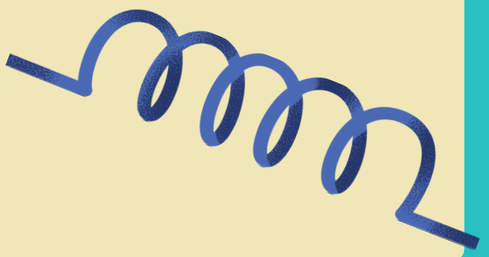
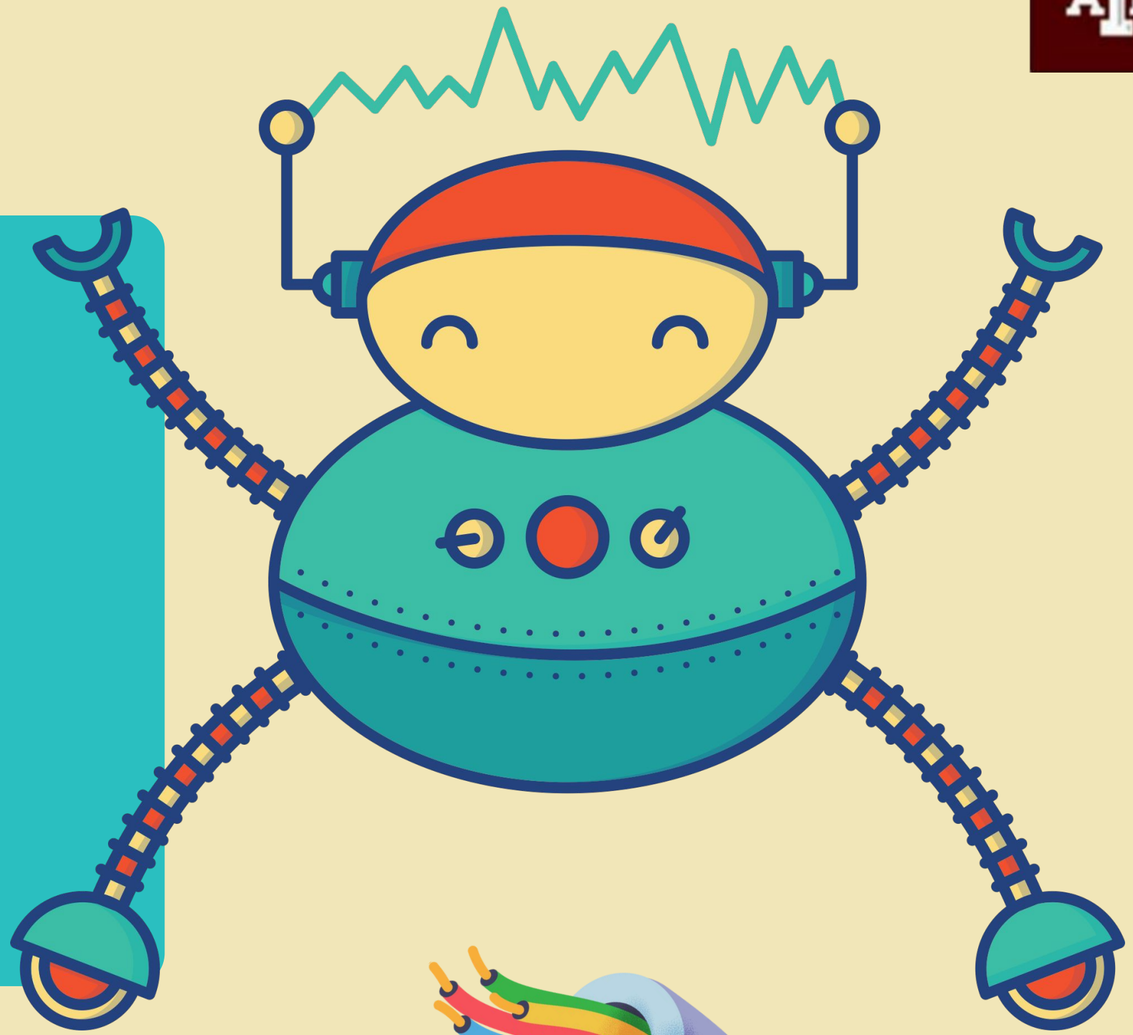


1. Introduction



Introduction

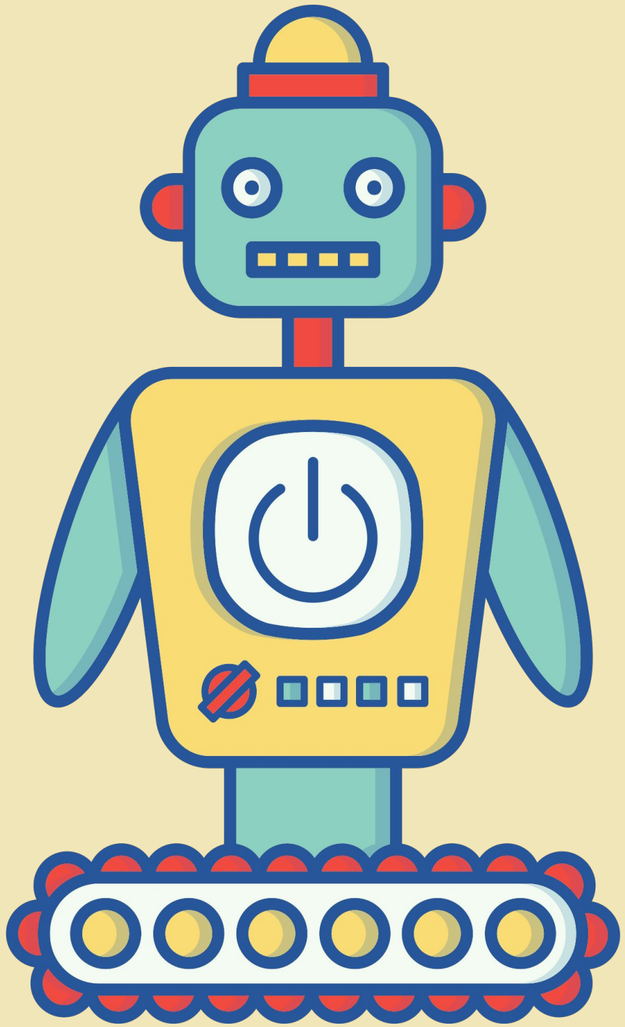
- Physical impairments may make it more difficult for a person to interact with others and their environment.

- Technological developments have created new opportunities for people with physical disabilities to enhance their lives.

- Guide gesture control is one of the technologies that enables a person with a disability to use finger movements to interact with devices

- The use of hand gesture control could enable people with physical disabilities to carry out tasks that might not be possible.

2. Problem Statement



Problem Statement

- Individuals with physical disabilities face significant challenges in maintaining independence within their homes.
- Current assistive technologies are costly and have limitations.
- There is a need for a cost-effective and nonintrusive solution to enhance the quality of life for patients with spinal cord injuries (SCI).

3. Proposed Solution

Proposed Solution

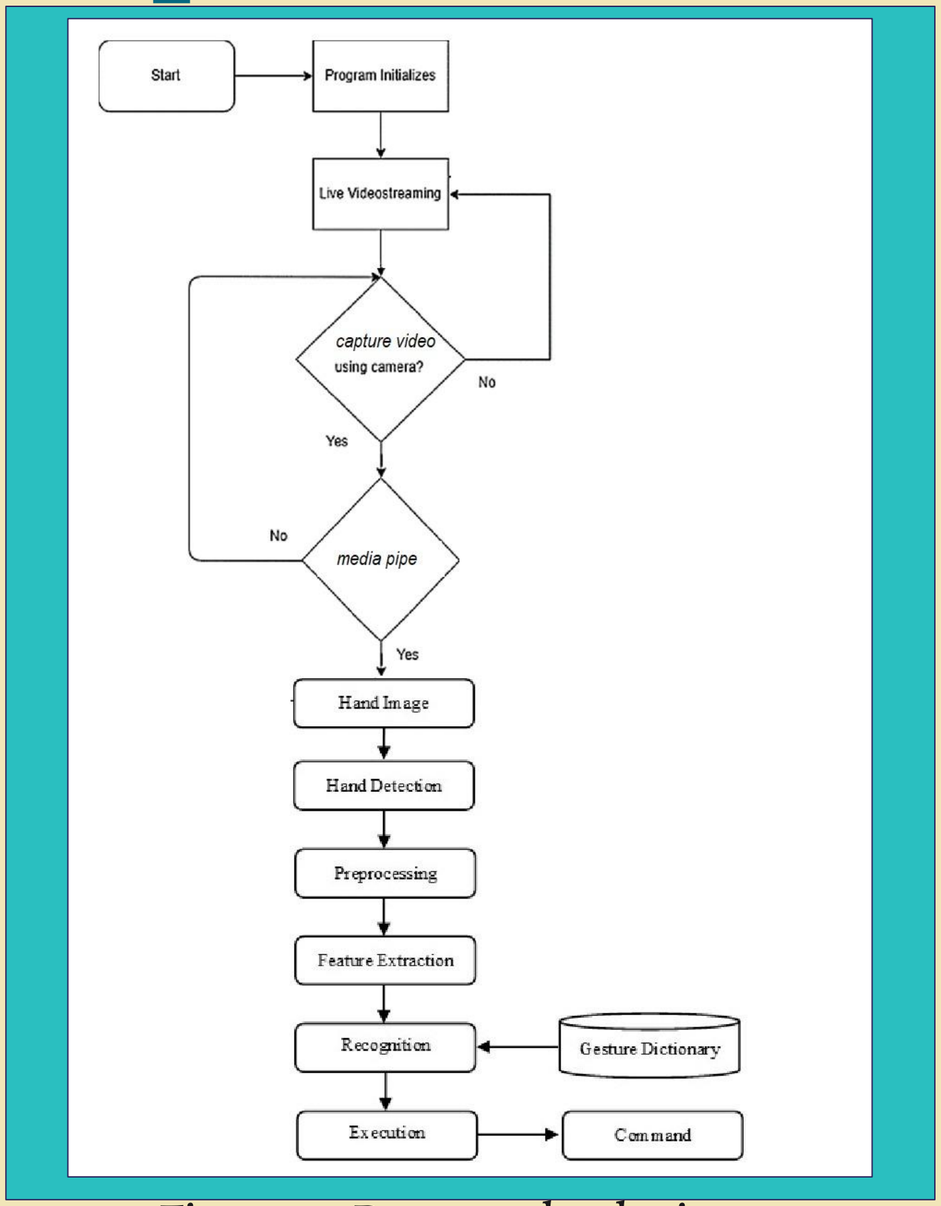


Figure 1: Proposed solution

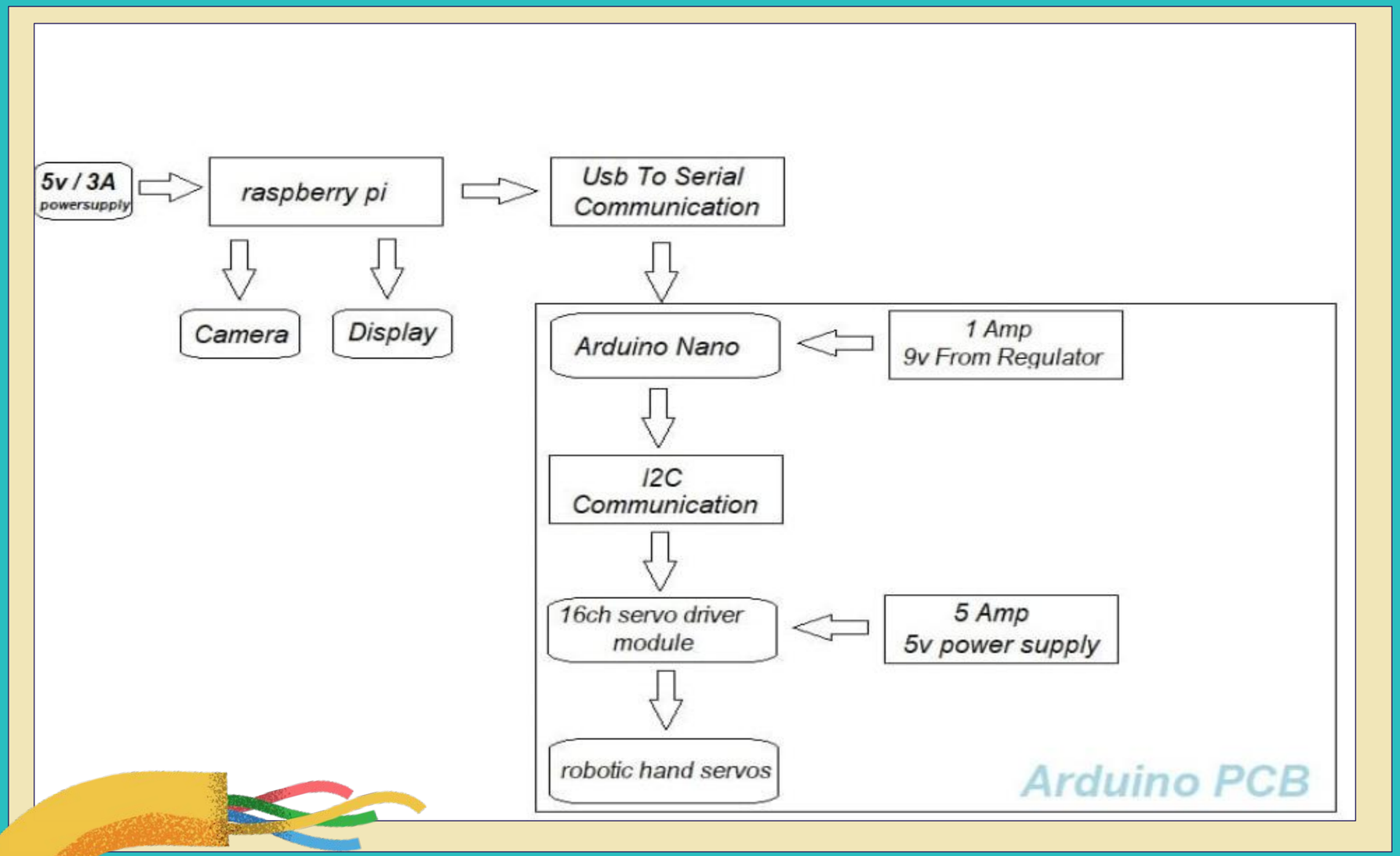


Figure 2: System Block Diagram

4. Functional Modeling

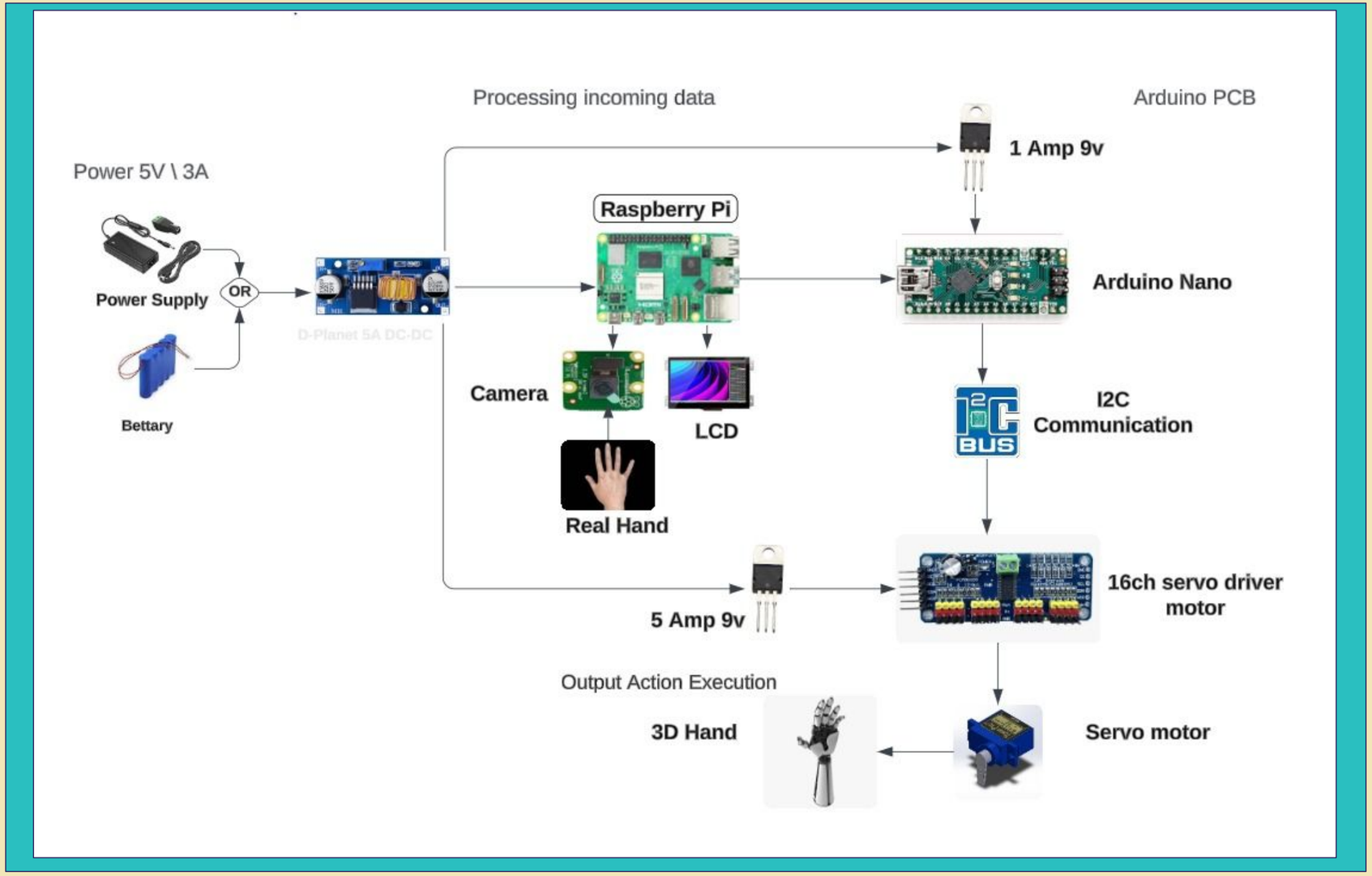


Figure 3 : Functional Modeling (using Components diagram)

5. Block Diagram

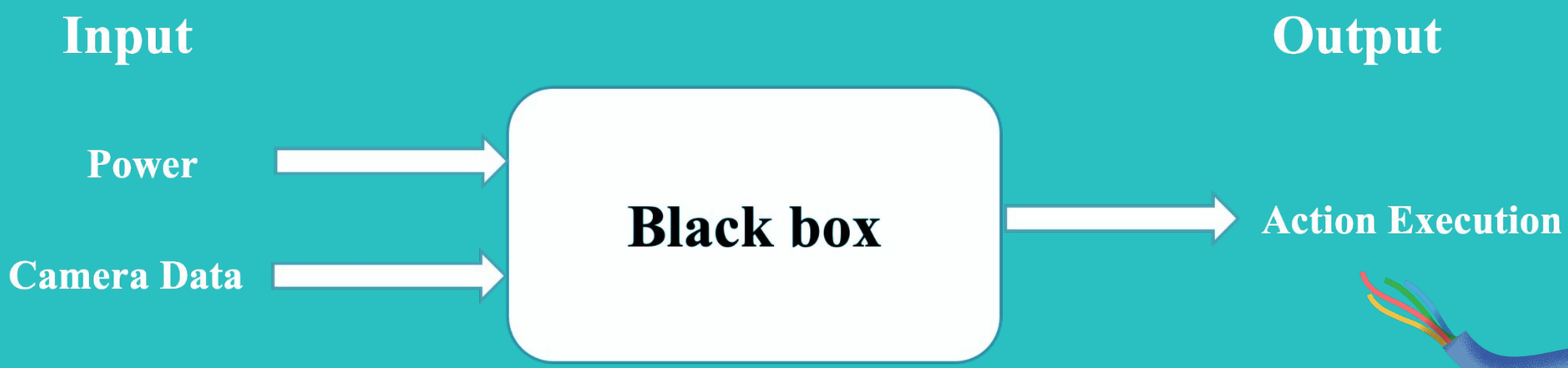


Figure 4: Block diagram

6. Relays Prototype Design

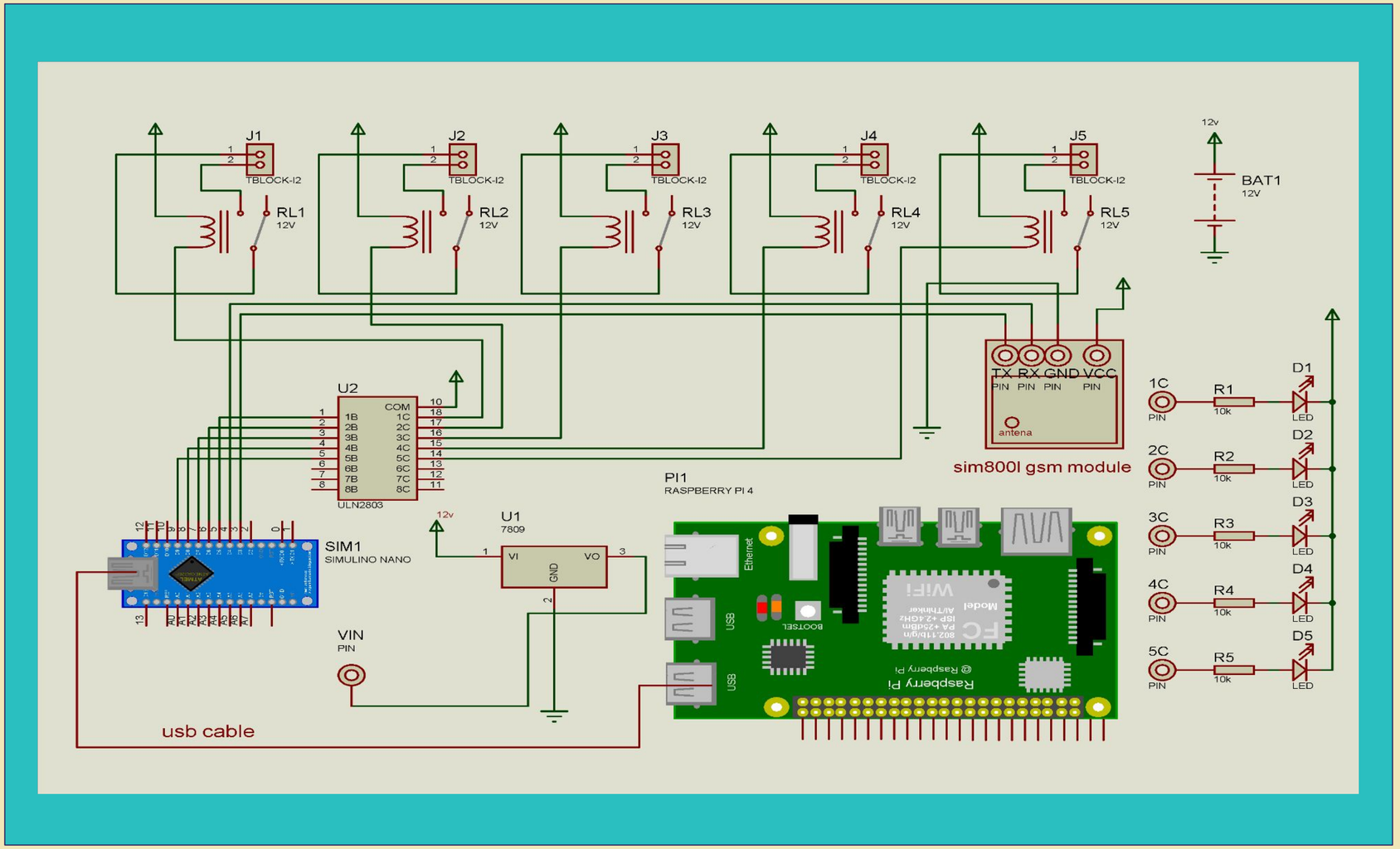


Figure 5 :Prototype 1 Design

7. Servo Motors Prototype Design

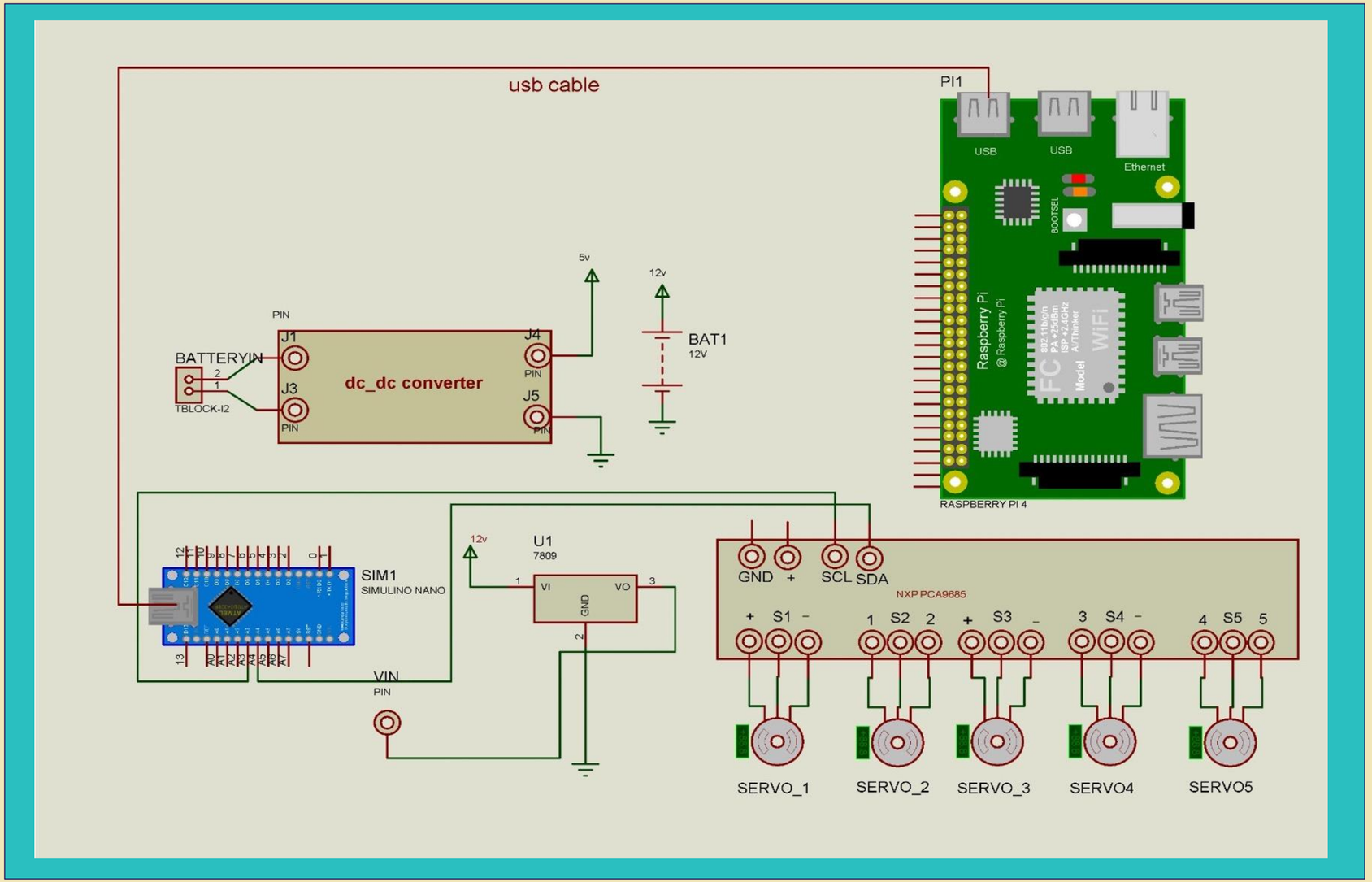


Figure 6 :Prototype 2 Design

8. Technical Standards and Constraints

- IEEE 11073

STANDARDS

Gesture recognition Accuracy

Operation Range

CONSTRAINTS

Software Compatibility

Cost Constraints

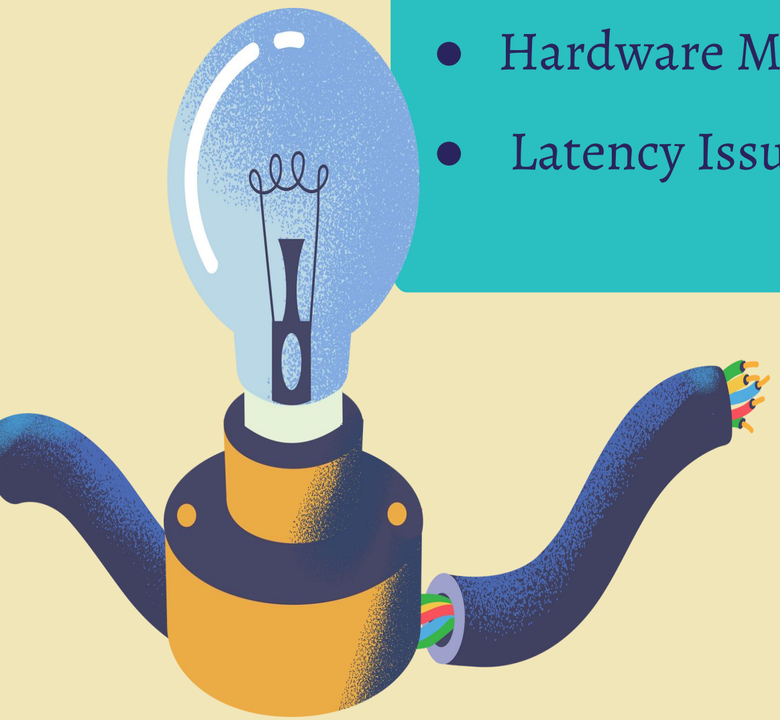
9. Risks:

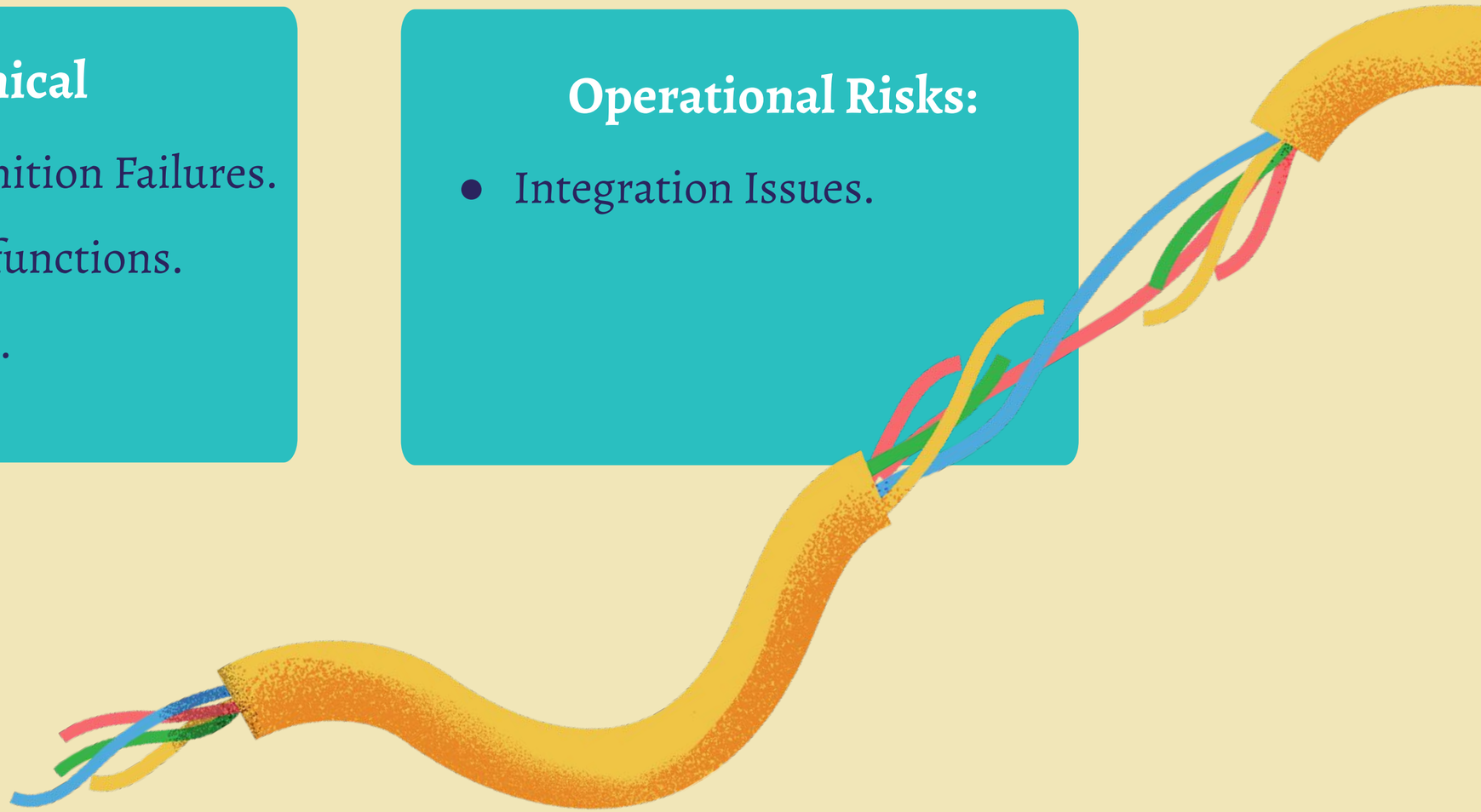
Technical

- Gesture Recognition Failures.
- Hardware Malfunctions.
- Latency Issues.

Operational Risks:

- Integration Issues.





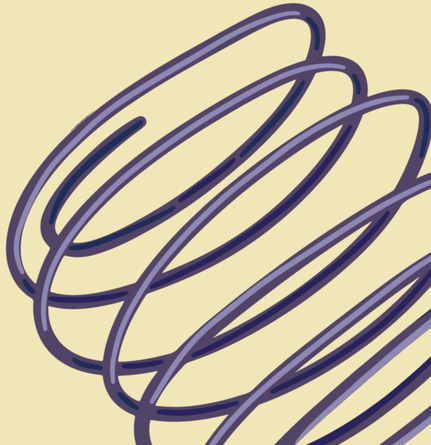
10. Performance Criteria

		Criteria			
		Environmental	**Economical**	**Performance**	**Attainability**
Existing Solutions	**Our Project**	Fewer procedural operations after training and testing, Lower power consumption and excellent user assistant.	Easy to use, technically inexpensive and content based project.	High Performance more than MFDT and HMM	High
	MFDT	Low impact	Moderate Considerations	Moderate performance	High
	HMM	Fewer uses than MFDT, lower power.	It needs training from the user first and then dealing with it	Similar performance of MFDT	Moderate
	3D-BHG	Low impact	High Considerations	High performance	Moderate
	CGA	Low impact	High Considerations	High performance	Moderate

Table 1 : Performance Criteria

11. Advantages of our Project

- Reduce Physical Strain
- Enhanced Independence
- Increase Accessibility



12. Simulation Results

Recognition Rates

- Percentage of accurately recognized gesture across different users

(>= 90% accuracy)

Latency Measurements

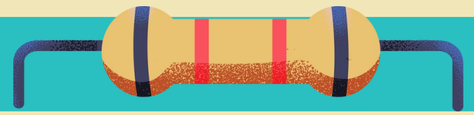
Average response time for gesture detection to system action

(< 100 ms)

Task Completion Time

Average time taken to complete specific task using our device vs. traditional method

(< 1 sec)



13. Analysis for designed circuits and program code

- Component Verification
- Connection Integrity
- Signal Timing
- Output Behavior

14. Mechanical Structure

Prototype House

Figure 7 : Prototype House

3D - Hand

Figure 8 : 3D Hand

15. Experimental testing and Results

Gesture Recognition Accuracy

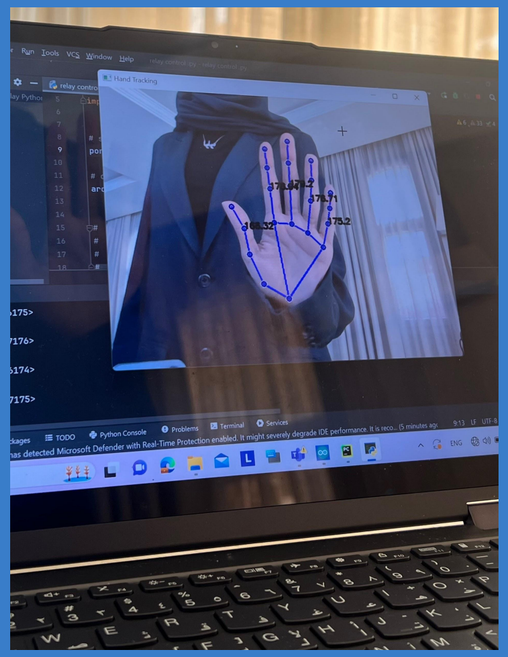


Figure 9 : Gesture Recognition Accuracy

Gesture Recognition With Outside Noise

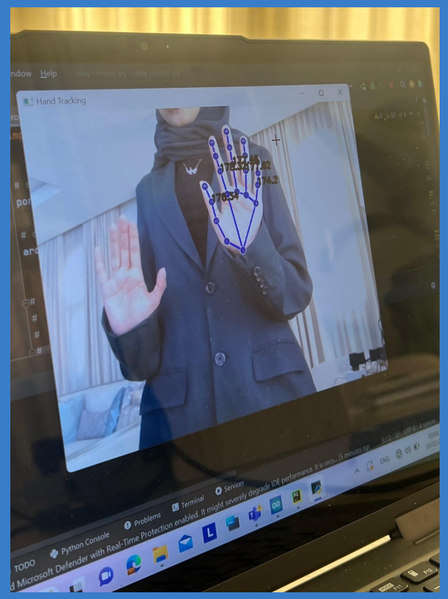


Figure 10 : Gesture Recognition With outside Noise

Gesture Recognition Under Different Conditions

Ex: Dim lights

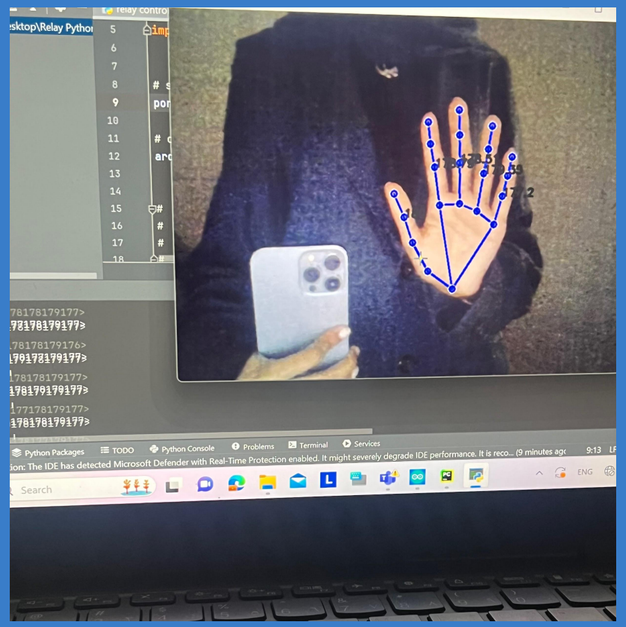
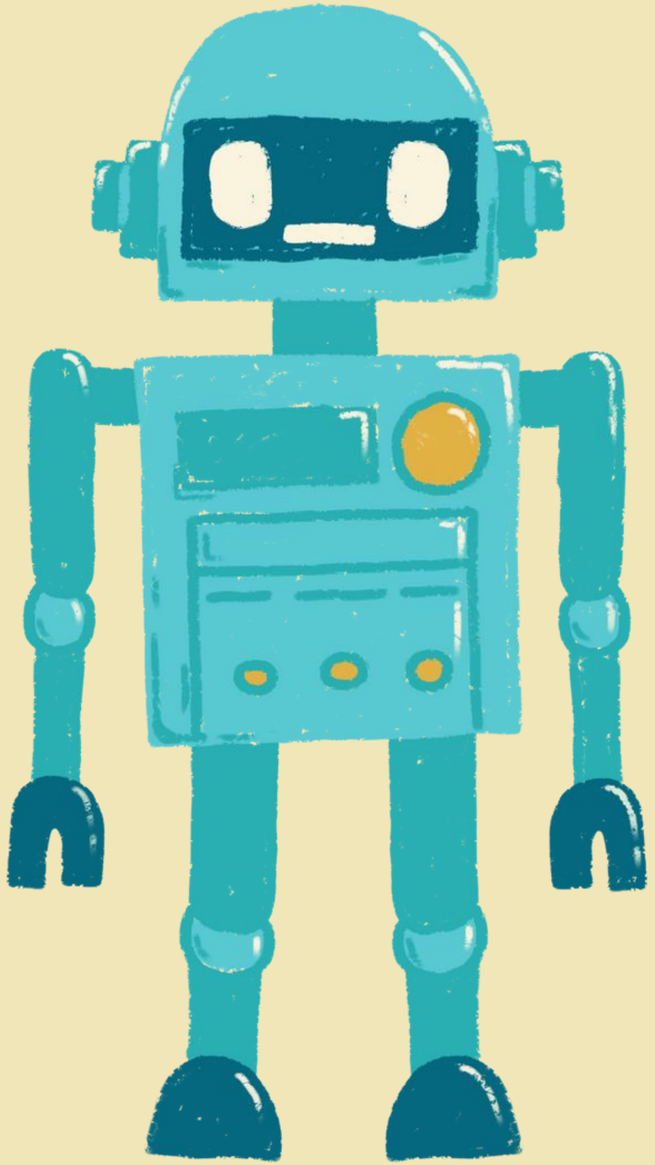


Figure 11 : Gesture Recognition Under Different Conditions

16. Functional Prototyping



17. Troubleshooting

Hardware

- Check power to components.
- Verify wiring and connections.
- Ensure microcontroller is functioning.

Software

- Review code for errors.
- Check gesture interpretations.
- Verify timing functions.

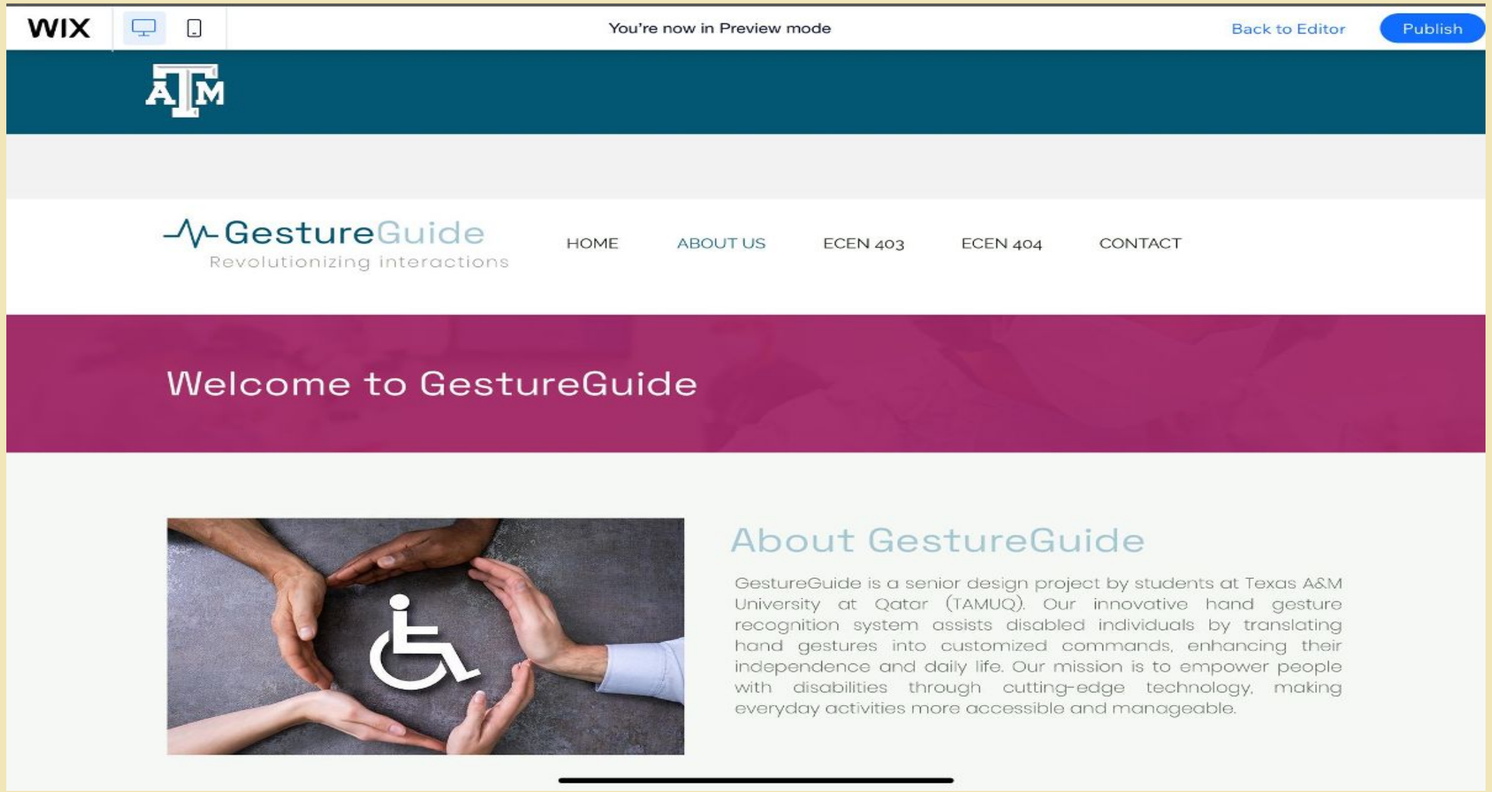
18. Conclusion

- Empowerment through Independence
- Enhanced Quality of Life
- Seamless User Experience
- High Accuracy and Speed
- Interaction with Electronic Devices

19. Future Recommendation & Improvement

- Continuous User Feedback
- Customization Options
- Integration with Other Technologies
- Target New Market
- Partnership With Organizations

20. Website



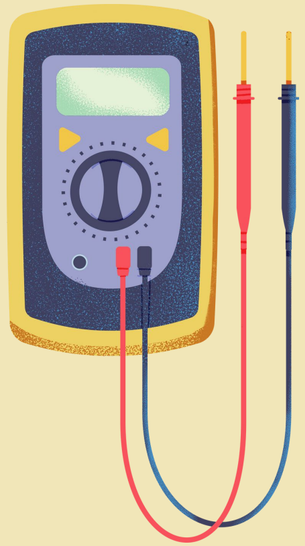


Figure 12 : Website

https://gestureguides.com

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Thank you !

Any Questions?