Automatic Controlled Car Parking System

Transitioning the Base Material to Wood

1. Introduction

The **Automated Controlled Car Parking System** is a fully automated and enclosed parking solution using sensors, motors, and an LCD display. It detects vehicles, counts available parking spaces, and provides real-time updates on a display. It also features LED indicators for occupied parking spaces.

Currently, the frame of the system is made of Styrofoam (Thermocol). However, this material has significant limitations. It is fragile, prone to breakage, and lacks the sturdiness required for more robust applications.

To address these issues, we explored alternatives such as **metal, plastic, and wood**. After evaluating the options, we decided to transition to wood. Wood offers a balance of durability, strength, and practicality for this stage of development. Although metal is a more advanced material, it is beyond the current scope but remains a potential future upgrade.

2. Objective

While the primary goal is to switch the base material from Styrofoam to wood, this transition brings opportunities for improvements:

1. **Enhanced Finish**: Paint the project for a polished look instead of using wrapping paper.
2. **Better Assembly**: Use nails and metal fasteners for a sturdier connection between components.
3. **Increased Capacity**: Add an extra parking spot to the system.
4. **Expansion of Components**: Include more Arduinos, motors, sensors, LEDs, LCDs, and wires to upgrade the system's functionality.

3. Advantages of Using Wood Over Other Materials

- **Eco-Friendliness**: Wood is a renewable and biodegradable resource, making it environmentally sustainable.
- **Durability**: Wood offers superior strength and sturdiness, making the system more resistant to physical damage.
- **Aesthetic Appeal**: It has a natural, customizable finish that can enhance the project's overall appearance.

4. Challenges of Using Wood

- **Susceptibility to External Factors**: Wood can be damaged by moisture, pests, or wear over time.
- **Higher Costs**: Additional materials like nails, fasteners, and tools such as a woodcutter increase the cost.
- **Precision Requirements**: Cutting and shaping wood for component mounting demands more accuracy than Styrofoam.

5. Design Adjustments for Wood

Component Mounting

To integrate components, we plan to follow the same basic approach used with Styrofoam: cut openings and insert the components. However, with wood, this process requires greater precision to ensure proper fit and stability.

Connecting Wood Pieces

We will use one of the following methods to assemble the wooden frame:

1. **Fasteners**: Nails and screws will provide a sturdy and secure connection.
2. **Joints**: Carved interlocking joints will offer additional stability and an elegant design.

6. Comparison with Existing Materials

Feature	**Styrofoam**	**Wood**
Cost	Lower	Higher
Environmental Impact	Biodegradable	Biodegradable
Durability	Lower	Higher
Weight	Lighter	Heavier
Lifespan	Lower	Moderate

7. Implementation Plan

(To be filled once the project progresses)

8. Results and Observations

(To be filled after testing and evaluation)

9. Conclusion

(To be added after results are obtained)

10. Appendices

(To include diagrams, additional data, and resources)