

Weekly Progress Report

Week 12

Period: 15–21 December 2024

Background

This week, the team made significant progress in the humanoid robot project, focusing on refining design interfaces, finalizing material choices, assembling mechanical components, and distributing tasks related to control systems. These updates reflect our commitment to delivering a functional and efficient design.

This Week's Progress

- **Design Interface Updates:**
 - Made several updates to enhance the design interface for improved functionality in the voice recognition application.
- **3D Design Printing and Material Selection:**
 - Successfully printed the 3D design using wood after extensive discussions on material options.
 - Reasons for selecting wood:
 1. **Cost Effectiveness:** Provides a budget-friendly option without compromising quality.
 2. **Eco-Friendly Choice:** Reduces environmental impact compared to synthetic materials.
 3. **Flexibility in Features:** Easy to modify or adapt to design changes.
 4. **Low Printing Time:** Ensures faster production cycles.
 5. **Ease of Reprinting:** Simplifies correction of errors in the design or printing process.

Here's an edited and more polished version of your text:

On-Site Fabrication Meeting

- A meeting was conducted to organize the fabrication process after procuring the required materials. The items and their intended purposes are as follows:
 - **2 DC Motors GA25-370 with Encoder (4.4 kHz, 130 RPM, 12V, with Bracket):**
 - Essential for motion control, providing precise speed and position feedback.
 - **IR Obstacle Avoidance Sensor:**
 - Enables proximity sensing and obstacle detection to enhance navigational capabilities.
 - **Micro Servo 5G90:**
 - Lightweight servo for fine control and small-scale movements.
 - **Servo Motor (Full Metal Gear):**
 - Heavy-duty servo designed for robust and reliable operations.
 - **Tracking Line Follower Sensor:**
 - Used to detect and follow predefined paths, critical for autonomous movement.
 - **Robot Wheel with Screws and DC Geared Motor (Dual Shaft):**
 - Facilitates smooth and efficient locomotion with a dual-shaft design for stability.
 - Began mechanical assembly of the printed parts to construct the humanoid's body.
 - **Progress:** Body design is 80% fabricated and assembled.
 - **MATLAB Control System Simulation:**
 - Distributed tasks among team members for creating a control system simulation using MATLAB.
 - **Power PCB Development:**
 - Designed and created components for the power PCB.
 - Completed schematic design and PCB layout for the power system.
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Challenges Encountered

- **Material Selection:**

- Challenge: Choosing a material that balances cost, functionality, and sustainability.
 - Solution: After evaluating multiple options, wood was selected for its eco-friendliness, cost-effectiveness, and ease of reprinting.
 - **Assembly Process:**
 - Challenge: Ensuring seamless alignment of printed parts during mechanical assembly.
 - Solution: Adopted an iterative approach to test and refine connections during assembly.
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Next Steps

- Complete the final 20% of the humanoid body fabrication.
- Test the assembled body for structural stability and functionality.
- Progress further on MATLAB control system simulation.
- Begin integrating the power PCB with the assembled humanoid structure.