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AI-Powered Mobile Robot for Assistance & Interaction

Overview

A compact, self-navigating mobile robot equipped with a tablet screen for:

- **Telepresence** – Virtual meetings and remote communication.
- **Smart Advertising** – Dynamic ad display based on location & audience.
- **Personal Assistance** – Home automation, security patrol, reminders.
- **Delivery** – Transporting small items in offices, hospitals, and homes.

This project is feasible, cost-effective, and aligns with Open Droids' mission!

Step-by-Step Guide to Build It

Step 1: Define Your Robot's Core Features

- **Autonomous Navigation** – Uses LiDAR, ultrasonic sensors, or cameras to avoid obstacles.
- **AI Voice Assistant** – Integrates with the OpenAI API (or Google Assistant) for smart responses.
- **Touchscreen Display** – A tablet or small LCD for user interaction.
- **Motorized Movement** – Controlled by motors and microcontrollers.
- **Battery-Powered** – Rechargeable battery pack for extended runtime.

Step 2: Select the Best Components

Mechanical Structure (Chassis & Frame)

- **Wheels/Tracks:** Omni wheels for smooth movement.
- **Frame Material:** Aluminum or 3D-printed parts.

Electronics (Core Processing & Sensors)

- **Microcontroller:** Raspberry Pi 4 (4GB) or Jetson Nano (AI Capable).
[Buy Here](#) – \$80
- **Motor Driver:** L298N or TB6612FNG.
[Buy Here](#) – \$10
- **Motors:** 12V DC motors or stepper motors.
[Buy Here](#) – \$30
- **LiDAR/Camera:** For object detection & navigation (OAK-D, RPLiDAR A1).
[Buy Here](#) – \$150

- **Battery:** 12V Li-ion or LiPo battery with charging circuit.
[Buy Here](#) – \$50

Interactive Components

- **Touchscreen Display:** 7-10 inch tablet or Raspberry Pi screen.
[Buy Here](#) – \$100
- **Speakers & Mic:** For voice assistant integration.
[Buy Here](#) – \$15
- **Wi-Fi & Bluetooth Module:** Typically built-in with Raspberry Pi.

Mechanical Frame

- **Frame:** Aluminum or 3D Printed parts – **\$30** (*Local supplier*)

Total Estimated Cost: \$465

Step 3: Software & AI Integration

- **Operating System:** Ubuntu or Raspberry Pi OS.
- **Navigation Software:** ROS (Robot Operating System) for path planning.
- **AI Assistant:** Integrate the OpenAI API or Google Assistant.
- **Remote Control:** Develop a web or mobile app-based control panel.

Step 4: Assembly & Coding

1. **Assemble the Chassis** – Mount the wheels, attach the motors, and install the LiDAR sensor.
2. **Wire the Electronics** – Connect the microcontroller, motor drivers, and sensors.
3. **Install Software** – Set up the operating system, install ROS, configure OpenCV for AI functionalities, and deploy the control interface.
4. **Test & Optimize** – Run calibration tests to ensure smooth movement and accurate AI responses.

Step 5: Submission PDF & Video

- **Project Report:** Prepare a detailed document outlining your design, component list, wiring diagrams, and implementation process.
- **Video Demonstration:** Record a walkthrough explaining the robot's features and functionality.
- **Submission:** Upload your report and video to the Open Droids Telegram group.

Need Further Assistance?

Let me know if you need any modifications or additional details!

