ELEGOO US-EL-KIT-012

ELEGOO UNO R3 Smart Robot Car Kit V4 Instruction Manual

Your comprehensive guide to assembling, operating, and programming your ELEGOO Smart Robot Car Kit V4.

1. Introduction

The ELEGOO Smart Robot Car Kit V4 is an educational STEM kit designed for beginners, especially kids aged 8 and up, to gain hands-on experience in programming, electronics assembly, and robotics. This kit provides an integrated solution for robotics learning, making it ideal for educational purposes. It features various module parts including obstacle avoidance, line tracing, infrared remote control, and can also be controlled via Android and iOS mobile devices.

2. What's in the Box

Your ELEGOO Smart Robot Car Kit V4 comes with a complete set of components necessary for assembly and operation. Please verify all parts are present before beginning assembly.



Figure 2.1: Overview of all included components in the kit, including the UNO R3 board, motors, wheels, sensors, and assembly tools.

Key Components:

- ELEGOO UNO R3 Board
- Smart Car Shield V4.0
- ESP32-WROVER-CAM Module
- Ultrasonic Sensor (HC-SR04)
- Line Tracking Module
- Infrared Remote Control
- DC Gear Motors (4x)
- Wheels (4x)
- Acrylic Chassis Plates (2x)
- Battery Holder
- USB Cable
- Various Wires, Screws, and Nuts

- Screwdrivers (2x)
- Assembly Tutorial (Digital)



Figure 2.2: The upgraded packaging design of the kit, indicating organized components.

3. Assembly

The assembly process is designed to be educational and hands-on. Follow the detailed HD rendering instructions provided in the digital tutorial. All module interfaces have been modified with XH2.54 ports for easier and more convenient assembly, reducing the chances of errors.

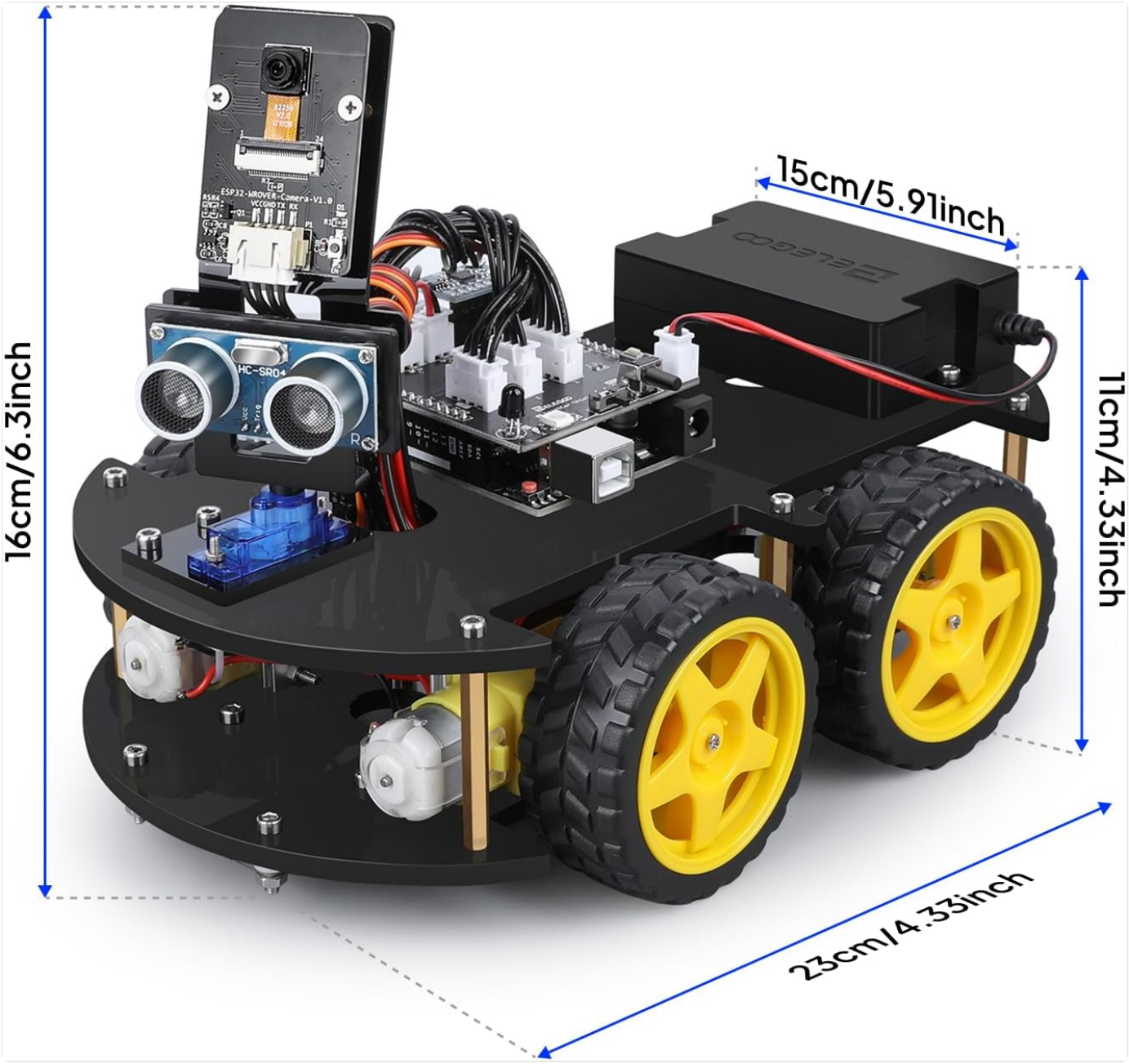


Figure 3.1: Fully assembled ELEGOO Smart Robot Car with key dimensions highlighted.

Assembly Tips:

- Organize your components: Lay out all parts for each step to avoid confusion.
- Follow the tutorial closely: The provided HD rendering instructions are crucial for correct assembly.
- Pay attention to wiring: Ensure all connections are secure and correctly oriented.
- Small parts: Some components are small; handle with care.

4. Setup

After successful assembly, prepare your robot car for operation:

1. **Power On:** Ensure batteries are correctly installed in the battery holder and connected to the car.
2. **Software Installation:** Download the necessary programs and codes from the official ELEGOO website. The UNO

R3 board comes pre-programmed for basic functions, but custom programming requires the Arduino IDE.

3. **Mobile App:** Download the ELEGOO mobile application from your Android or iOS app store. This app allows for remote control and programming.

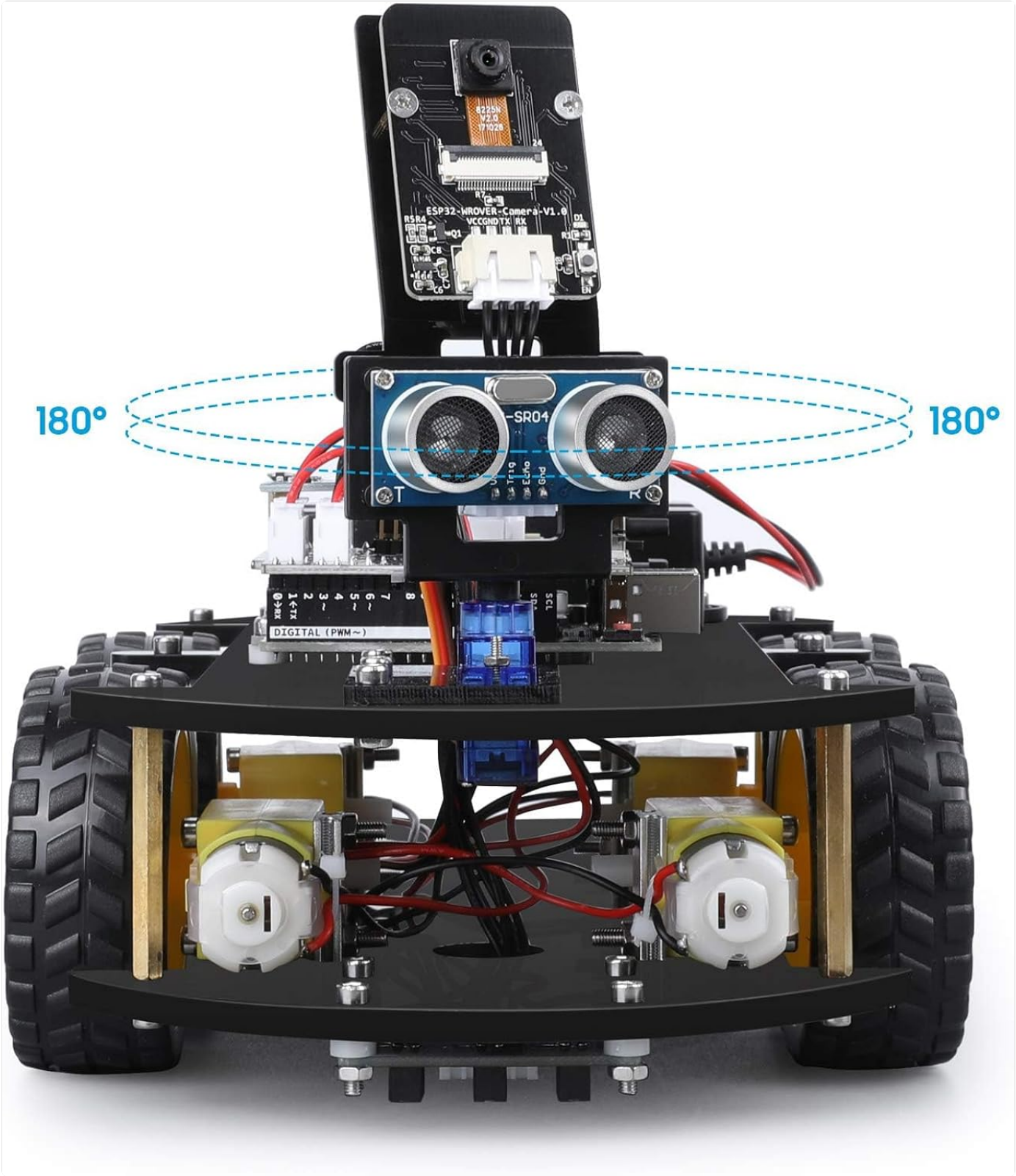


Figure 4.1: The robot car being controlled wirelessly via the dedicated smartphone application.

5. Operating Modes

The ELEGOO Smart Robot Car V4 supports multiple operating modes, offering diverse functionalities:

- **Obstacle Avoidance Mode:** The robot uses its ultrasonic sensor to detect obstacles and navigate around them automatically.

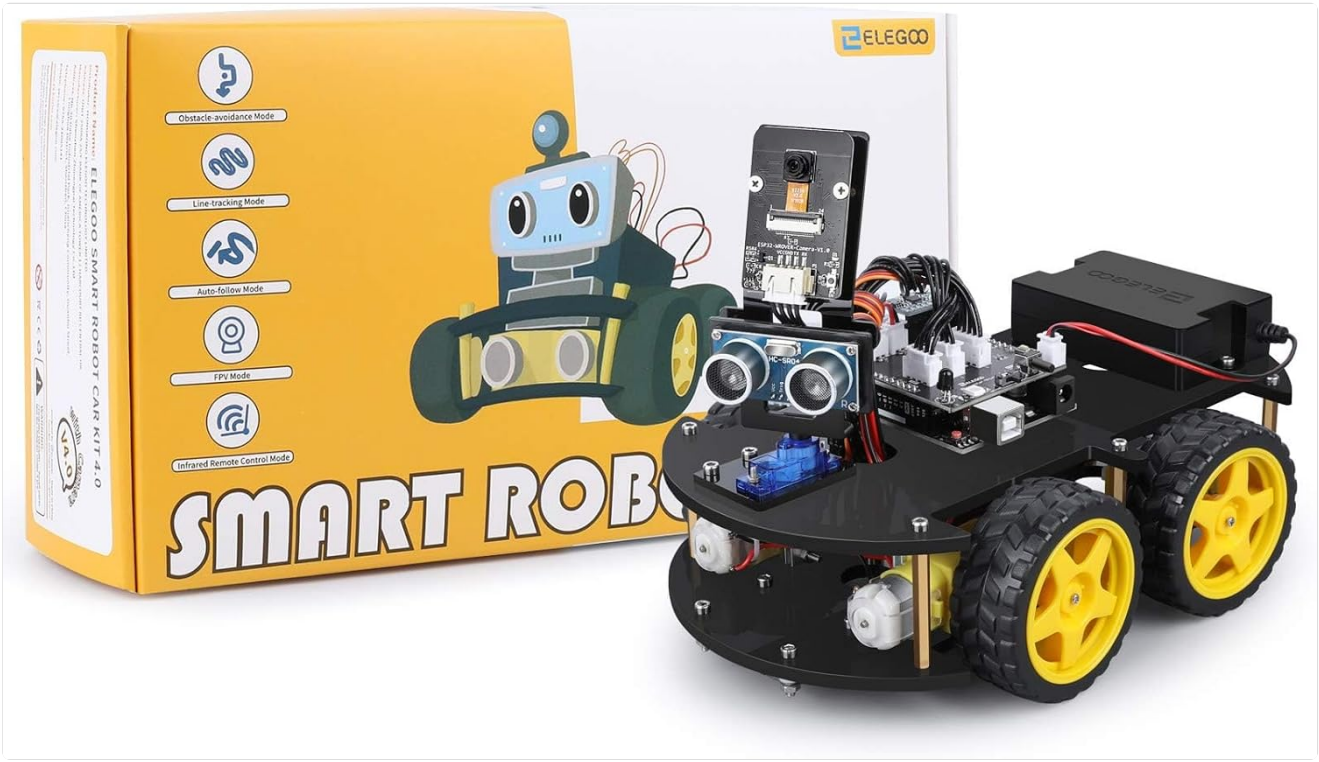


Figure 5.1: The robot car actively avoiding obstacles using its ultrasonic sensors.

- **Line Tracking Mode:** The robot follows a black line on a light-colored surface using its line tracking module.
- **FPV (First-Person View) Mode:** Utilize the integrated camera to stream live video to your smartphone, allowing for remote driving with a real-time view.

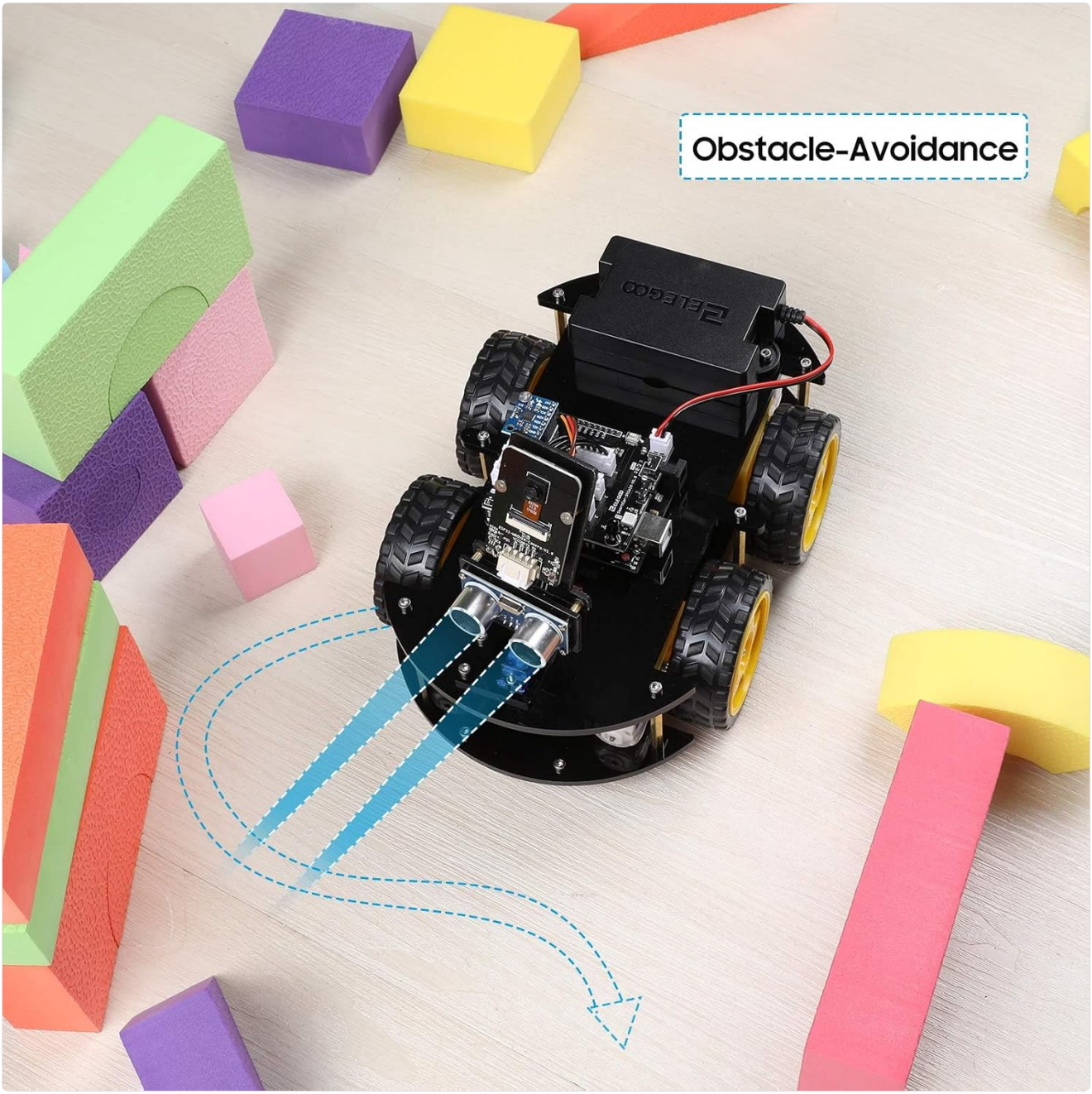


Figure 5.2: A smartphone screen showing the live first-person view from the robot car's camera.

- **Infrared Remote Control:** Control the robot car using the included infrared remote for basic movements.



Figure 5.3: Visual representation of the different operating modes available for the robot car.



Figure 5.4: The robot car's ultrasonic sensor capable of 180-degree rotation for wider detection.

6. Programming/Coding

The ELEGOO Smart Robot Car V4 is fully compatible with Arduino, making it an excellent platform for learning programming. The kit includes all necessary programs and codes, and the mobile app features a block-based coding interface for easy learning.

Getting Started with Programming:

- **Arduino IDE:** For advanced users or those looking to delve deeper into coding, the Arduino IDE provides a powerful environment to write and upload custom programs to the UNO R3 board.
- **Block-Based Coding (App):** The ELEGOO app offers a user-friendly block-based programming interface, allowing beginners to drag and drop code blocks to create sequences of actions for the robot. This simplifies the learning curve for basic coding concepts.

7. Maintenance

To ensure the longevity and optimal performance of your ELEGOO Smart Robot Car, follow these maintenance guidelines:

- **Cleaning:** Regularly wipe down the robot with a dry, soft cloth to remove dust and debris. Avoid using liquids directly on electronic components.
- **Battery Care:**
  - Use only the recommended Lithium Metal batteries.
  - Remove batteries if the robot will not be used for an extended period.
  - Ensure proper polarity when inserting batteries.
- **Component Check:** Periodically inspect all connections and screws to ensure they are secure. Tighten any loose parts.
- **Storage:** Store the robot in a cool, dry place away from direct sunlight and extreme temperatures.

8. Troubleshooting

If you encounter issues with your robot car, refer to the following common problems and solutions:

Problem	Possible Cause	Solution
Robot does not power on.	Incorrect battery installation, low batteries, loose power connection.	Check battery polarity, replace batteries, ensure power cables are securely connected.
Motors not responding.	Loose motor connections, incorrect wiring, motor driver issue.	Verify all motor wires are correctly attached to the shield. Recheck wiring against the tutorial.
Obstacle avoidance not working.	Ultrasonic sensor misaligned or disconnected, incorrect code uploaded.	Ensure ultrasonic sensor is firmly connected and facing forward. Re-upload the correct obstacle avoidance code.
Line tracking not working.	Line tracking module misaligned or dirty, incorrect code, line too thin/light.	Clean the sensors, ensure they are positioned correctly over the line. Use a clear, dark line on a light background. Re-upload line tracking code.
Mobile app connectivity issues.	Wi-Fi signal weak, incorrect Wi-Fi settings on ESP32-CAM, app not updated.	Ensure strong Wi-Fi signal. Verify ESP32-CAM is broadcasting its Wi-Fi or connected to your network. Update the ELEGOO app.

9. Specifications

- **Product Dimensions:** 8 x 7 x 6 inches
- **Item Weight:** 2.7 pounds
- **Item Model Number:** US-EL-KIT-012
- **Manufacturer Recommended Age:** 12 years and up (Note: Applicable Age: 8+ with adult guidance)
- **Batteries:** 1 Lithium Metal battery required (included)
- **Country of Origin:** China
- **Release Date:** May 1, 2019
- **Manufacturer:** ELEGOO

10. Safety Information

Warning: Small parts not suitable for babies or young children. Adult supervision is recommended for users under 12 years of age due to the complexity of assembly and handling of small components.

11. Warranty and Support

ELEGOO provides customer support for its products. For any technical assistance, missing parts, or warranty inquiries, please refer to the contact information provided in your product packaging or visit the official ELEGOO website. The product typically comes with a standard manufacturer's warranty. Please retain your proof of purchase for warranty claims.
For additional resources and community support, you may visit theELEGOO Store on Amazon.

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Example: How do I reset this device or fix this error?

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Model number, symptoms, what you tried, or the section of the manual you are using.

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