JetRacer AI Kit User Manual

1\. Safety and Handling

General Safety:

Always operate the JetRacer AI Kit in a clear, open area to avoid collisions.

Keep the workspace free of obstacles and hazards.

Ensure that the device is turned off when not in use.

Electrical Safety:

Handle the NVIDIA Jetson Nano with care to avoid static discharge.

Use the provided power supply to avoid damage to the components.

Do not expose the kit to moisture or extreme temperatures.

Mechanical Safety:

Be cautious of moving parts during operation.

Avoid placing fingers or objects near the wheels while the device is powered on.

2\. Startup and Shutdown

Startup Instructions:

1. Connect Power:

Plug the power supply into the JetRacer AI Kit.

Ensure the power switch is in the "ON" position.

2. Booting Up:

Wait for the NVIDIA Jetson Nano to boot up (indicated by LED lights).

Connect to the device via Wi-Fi or Ethernet as per your network setup.

3. Launch Software:

Open the JetRacer application on your computer.

Ensure that the JetRacer is detected by the application.

Shutdown Instructions:

1. Power Down:

Close any running applications connected to the JetRacer.

Turn off the power switch on the JetRacer AI Kit.

2. Disconnect Power:

Unplug the power supply from the device.

3\. Controller or Operation Instructions

Remote Control:

Use a compatible game controller or keyboard for manual operation.

Connect the controller via USB or Bluetooth as per the device specifications.

Basic Movement Controls:

Forward: Press the "W" key or the forward button on the controller.

Backward: Press the "S" key or the backward button on the controller.

Turn Left: Press the "A" key or the left button on the controller.

Turn Right: Press the "D" key or the right button on the controller.

Autonomous Mode:

Select the autonomous mode from the JetRacer application.

Follow the on-screen instructions to set up object tracking or lane detection.

4\. Advanced Programming / Connectivity

Programming Environment:

The JetRacer AI Kit supports Python programming.

Install necessary libraries such as OpenCV and TensorFlow for AI tasks.

Connecting to Wi-Fi:

1. Access the settings menu on the Jetson Nano.
2. Select the Wi-Fi option and choose your network.
3. Enter the password and connect.

Remote Access:

Use SSH to access the Jetson Nano remotely.

Use the command: `ssh username@ipaddress` to connect.

5\. AI Features and Sensing

Object Tracking:

Utilize the built-in camera for real-time object detection.

Configure object tracking parameters in the JetRacer application.

Lane Detection:

Implement lane detection algorithms using the camera feed.

Adjust sensitivity settings for optimal performance.

Reinforcement Learning:

Train the JetRacer using reinforcement learning frameworks.

Monitor performance metrics through the application interface.

6\. Maintenance and Troubleshooting

Regular Maintenance:

Clean the camera lens and sensors regularly to ensure clear vision.

Check for loose connections and secure them as needed.

Troubleshooting Common Issues:

Device Won't Start:

Ensure the power supply is connected and functional.

Check the power switch position.

Connectivity Issues:

Verify Wi-Fi settings and ensure the correct network is selected.

Restart the Jetson Nano and try reconnecting.

Poor Performance:

Check for obstructions in the camera view.

Ensure the software is updated to the latest version.

7\. Additional Notes

Documentation and Resources:

Refer to the official NVIDIA Jetson documentation for advanced configurations.

Join online forums and communities for support and project ideas.

Experimentation:

Feel free to experiment with different AI models and algorithms.

Document your findings and share them with the Makerspace community.

Support:

For further assistance, contact the Makerspace staff or refer to the user community for help.

Resources:

- Manual Pdf:

/manuals/jetracer_kit_manual.pdf
- Tutorial Video:

https://www.youtube.com/watch?v=6aJOkF6gK6Q
- Qr Link:

https://github.com/NVIDIA-AI-IOT/jetracer