ZMROBO ROS

网址: www.zmrobo.com



Robot Operating Platform



Version	Date	Content
V1.0	2020/01/11	First release
V2.0	2022/06/04	Second release

Catelog

1. Introduction to ZMROS
2. Introduction to Various Versions of ZMROS Components
3. ZMROS Manual
4. Precautions for Use and Battery Safety
5. Quick Start Video
6. ZMROS Assembly Tutorial
6.1. Assembly Step (1)
6.2. Assembly Step (2)
6.3. Assembly Video (3)
7. Remote Control Experience Tutorial
7.1. Mobile APP Remote Control Tutorial
7.2. Model Aircraft Remote Control Tutorial
7.3. USB Wireless Controller + Mobile Screen Remote Control Tutorial
8. ROS Robot Expansion Board Function Tutorial
8.1. Introduction to Expansion Board V_2.0
8.2. Introduction to Expansion Board V_1.0
8.3. Setting Up STM32 Development Environment
8.4. Button Control to Activate Buzzer
8.5. FreeRTOS Application
8.6. Serial Communication
8.7. SBUS Model Aircraft Remote Control
8.8. CAN Bus Communication
8.9. RGB Colorful Light Strip
8.10. Timer Interrupt Control of PWM Servo
8.11. Control of Serial Servo
8.12. Acquiring Data from Nine-Axis Attitude Sensor
8.13. Control Motor Forward and Reverse
8.14. Timer Capture Encoder Data
8.15. Robot Kinematics Analysis Theory
9. Expansion Tutorial
9.1. Jetson Nano Image Burning
9.2. Jetson Xavier NX SSD Image Burning
9.3. Jetson TX2 NX SSD Image Burning
9.4. Raspberry Pi Image Burning
9.5. NX & TX2 NX Mainboard Flashing Tutorial

10. ROS Basic Course
10.1. Introduction to ROS
10.2. ROS Installation
10.3. Common ROS Command Tools
11. OpenCV Series Course
11.1. Introduction to Open Source CV
11.2. Open Source CV Geometric Transformations
11.3. Open Source CV Image Processing and Drawing Text and Lines
11.4. Open Source CV Image Beautification
11.5. OpenCV Applications
11.6. AR Vision
11.7. AR QR Code
11.8. ROS+OpenCV Basics
11.9. ROS+OpenCV Applications
11.10. Data Conversion and Point Cloud
11.11. Mediapipe Development
12. Robot Control
12.1. PID Algorithm Theory
12.2. Robot PID Tuning
12.3. Robot Information Publishing
12.4. Robot Keyboard Control
12.5. Robot Joystick Control
12.6. Robot State Estimation
12.7. Robot Calibration
12.8. Robot URDF Model
13. Depth Camera
13.1. Using Astra Camera
13.2. Astra Camera Calibration
13.3. Astra Color Tracking
13.4. Astra Object Tracking
13.5. Vision-Based Lane Following Autonomous Driving
13.6. Pure Vision 2D Mapping and Navigation
13.7. RTAB-Map Mapping and Navigation
13.8. ORB_SLAM2 Basics
13.9. ORB_SLAM2_Octomap
14. Lidar
14.1. Precautions for Using Radar
14.2. Basics of Radar (Exclusive to EAI Series Radar)
14.3. Basics of Radar (Exclusive to Slamtec Series Radar)

14.4. Radar Obstacle Avoidance	
14.5. Radar Guard	
14.6. Radar Follow	
14.7. Robot Patrol	
14.8. Gmapping Mapping Algorithm	
14.9. Hector Mapping Algorithm	
14.10. Karto Mapping Algorithm	
14.11. Cartographer Mapping Algorithm	
14.12. Rrt_exploration Mapping Algorithm	
14.13. Navigation Obstacle Avoidance	
14.14. AMCL Adaptive Monte Carlo Localization	
14.15. APP Mapping and Navigation	
14.16. Teb Path Planning Algorithm (Exclusive to R2 Vehicle Model)	
14.17. Multi-Robot Formation	
14.18. Multi-Robot Joystick Control	
14.19. Multi-Robot Navigation	
14.20. Multi-Robot Surround	
15. Deep Learning	
15.1. KNN Recognition of Handwritten Digits	•
15.2. Basic Use of TensorFlow	
15.3. Basic Use of PyTorch (Jetson)	
15.4. Yolov5 Model Training (Jetson)	
15.5. Yolov5+TensorRT Acceleration (Jetson)	
15.6. Yolov4-tiny	
16. Voice Control	
16.1. Introduction and Use of Voice Control Module	
16.2. Voice Control Module Port Binding	
16.3. Voice Control Car Movement	
16.4. Voice Control Autonomous Driving	
16.5. Voice Control Color Recognition	
16.6. Voice Control Color Tracking	
16.7. Voice Control Multi-Point Navigation	
16.8. Model Training for Autonomous Driving	
16.9. Precautions (Must Read!!)	
16.10. Training Traffic Signs with Yolov5	
16.11. Accelerating Recognition with TensorRT	· • • •
16.12. Calibrating Autonomous Driving Data	
16.13. Data Collection	
16.14. Model Training	

16.15. Model Conversion and Application
16.16. Starting Autonomous Driving
17. ROS2 - Remote Control Experience Tutorial
17.1. Mobile APP Remote Control Tutorial
17.2. Model Aircraft Remote Control Tutorial
17.3. USB Wireless Controller + Mobile Screen Remote Control Tutorial
18. ROS2 - Remote Login Operations
18.1. SSH and VNC Remote Login
19. ROS2 - ROS Robot Expansion Board Function Tutorial
19.1. Introduction to Expansion Board V_2.0
19.2. Introduction to Expansion Board V_1.0
19.3. Setting Up STM32 Development Environment
19.4. Button Control to Activate Buzzer
19.5. FreeRTOS Application
19.6. Serial Communication
19.7. SBUS Model Aircraft Remote Control
19.8. CAN Bus Communication
19.9. RGB Colorful Light Strip
19.10. Timer Interrupt Control of PWM Servo
19.11. Control of Serial Servo
19.12. Acquiring Data from Nine-Axis Attitude Sensor
19.13. Control Motor Forward and Reverse
19.14. Timer Capture Encoder Data
19.15. Robot Kinematics Analysis Theory
20. ROS2 - ZMROS Basic Control Tutorial
20.1. Update Expansion Board Firmware
20.2. Disable Boot Auto-Start of Major Programs
20.3. Install ZMROS Driver Library
20.4. Buzzer Beeping
20.5. Control PWM Servo
20.6. RGB Colorful Light Strip Effect Display
20.7. Control Motor Forward and Reverse
20.8. Control Robot Movement
20.9. Control Serial Servo
21. ROS2 - Linux Operating System
21.1. Virtual Machine
21.2. Basics of Linux
21.3. Remote Control
21.4. Multi-Machine Communication Configuration

	21.5. Static IP and Hotspot Mode
	21.6. Binding Device ID
	21.7. Web Real-Time Monitoring
22	2. ROS2 - Docker
	22.1. Overview of Docker and Docker Installation
	22.2. Common Commands for Docker Images and Containers
	22.3. Deep Understanding of Docker Images and Publishing Images
	22.4. Docker Hardware Interaction and Data Processing
	22.5. Entering the Robot's Docker Container
	22.6. Building a Robot Development Environment in Docker
	22.7. Future Methods for Customers to Update Docker Images
23	3. ROS2 - ROS2 Basic Tutorial
	23.1. Introduction to ROS2
	23.2. Installing ROS2 Foxy
	23.3. Setting Up ROS2 Integrated Development Environment
	23.4. ROS2 Workspace
	23.5. ROS2 Packages
	23.6. ROS2 Nodes
	23.7. Implementing ROS2 Topic Communication Publisher
	23.8. Implementing ROS2 Topic Communication Subscriber
	23.9. Implementing ROS2 Service Communication Server
	23.10. Implementing ROS2 Service Communication Client
	23.11. Implementing ROS2 Action Communication Server
	23.12. Implementing ROS2 Action Communication Client
	23.13. ROS2 Custom Interface Messages
	23.14. ROS2 Parameter Service Case Study
	23.15. Introduction to ROS2 Metapackages
	23.16. ROS2 Distributed Communication
	23.17. ROS2 DDS
	23.18. ROS2 Time-Related APIs
	23.19. Common ROS2 Command Tools
	23.20. Using ROS2 Rviz2
	23.21. ROS2 Rqt Toolbox
	23.22. Implementing ROS2 Launch with Python
	23.23. Implementing ROS2 Launch with Xml, Yaml
	23.24. ROS2 Recording and Playback Tools
	23.25. Introduction to ROS2 URDF Models
	23.26. Introduction to ROS2 Gazebo
	23.27. Introduction to ROS2 Coordinate Transformation TF2

23.28. ROS2 Coordinate Transformation TF2 Case Study	_
24. ROS2 - Robot Chassis and Control	