

XENTRINOBOT 101

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PREFACE

CHAPTERS

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Introductions to Robotics and ROS

Explanation

Resources Github/Bitbucket

Documentation ROS Wiki

References.

Download and Installing ROS package

Testing ROS installations

How to add from source or GitHub

Compiling ROS

ROS protocol and work flow

Understanding ROS

ROS Structures

ROS Node, Services and messages

ROS Client and server

Open source ROS

2WD Differential Drive Robot

Computing on 2WD Robots

Kinematics

Inverse Kinematics

Design of 2WD Differential Drive Robot

Base/Frame CAD

Wheel CAD

Caster Wheel CAD

Sensor /Lidar CAD

Simulation of 2WD Differential Drive Robot

URDF

XACRO

CAD Import

Simulation of 2WD Differtial Drive Robot in Gazebo

ROS + Gazebo

Gazebo GUI

Gazebo Plugin

Gazebo Physics

Building a 2WD Differential Drive Robot

Software:

RVIZ

XACRO

GAZEBO

C/C++ /Python

Hardware:

Motor plus Encoder
Controller board
Battery
Microcontroller

ROS Launching Program and Data Structures

Definition as executions
Launch file and its directory
Launch file and its argument
Launch file and its default settings

Testing ROS Examples on XentrinoBot -101 assembly

ROS + Microcontroller
ROS + Motor
ROS + Encoder
ROS + IMU
ROS + Input Control

Calibration of XentrinoBot 101

PID
Gyro
Acceleration
Distance

Running XentrinoBot 101 on ROS

Running Calibration and Precision on XentrinoBot 101 movements for the 2nd time
Running XentrinoBot 101 Laser Scanner or Sensors
Running XentrinoBot 101 Gmapping
Running XentrinoBot Move Base /Navigation

Additional XentrinoBot 101 ROS features

Integrating MacRon Lidar
Integrating Video Camera
XentrinoBot 101 WayPoint Navigation

Discussions and Summary

Hi-Techno Barrio Github
XentrinoTech
PSCoE
How to order
Training and Seminars

