**XENTRINOBOT 101**

**Christopher M Coballes**

**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/Frema 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

Hardware:

Motor plus Encoder

Controller board

Battery

**Testing XentrinoBot -101 build**

ROS + Microcontroller

ROS + Motor

ROS + Encoder

ROS + IMU

ROS + Input Control

**Calibration of XentrinoBot 101**

PID

Gyro

Acceleration

Distance