Automation and Robotics Engineering (ARE)

ARE Seminar Series

Department of Mechanical Engineering

Organized by Robotics Club, AVV, Coimbatore campus

AMRITA VISHWA VIDYAPEETHAM

श्रद्धावान् लभते ज्ञानम्

3-day Workshop on Robot Operating System

Day-1, 16th Dec, Friday 4:00 pm to 6:00 pm

Introduction to the workshop,

- ○ Structure of the program
- ○ Objectives
- ○ Overview of the Robot Operating System
- ● Installations
- ○ Setting Up Virtual machine
- ○ Setting Up Ubuntu in virtual machine with useful tools for ROS installation
- ○ Installing and getting started with ROS
- ■ Dependencies
- ■ Environment setup

DELIVERED BY: ANYA ROBOTICS, PVT. LTD.

Day-2, 17th Dec, Saturday (6 hrs)

9:30-11:00 AM

- ● Introduction to ROS
- ○ An architectural overview of the Robot Operating System Framework
- ● Packages & Catkin workspaces
- ○ ROS workspace structure
- ○ Essential command line utilities
- ○ Software Package management within a project

15 minutes break

11:15-1:00 PM

- ● Understanding fundamentals of ROS using turtlesim
- ● Learning basic ROS tools with turtlebot simulation

Lunch break

2:00-3:30 PM

- ● Overview of a ROS based robot
- ● Understanding Unified Robot Description Format (URDF) of a robot
- ● RViz Basics

15 minutes break

3:45-5:15 PM

- ● Debugging in ROS - Transform Frames
- ● Extending a robot Creation - Launch Files
- ● Q&A session

Day-3, 18th Dec, Sunday (6 hrs)

9:30-11:00 AM

- ● Gazebo Basics
- ○ Exploring Gazebo User Interface
- ○ Writing Launch files using prebuilt gazebo worlds
- ○ Intro to Gazebo plugins

15 minutes break

11:15-1:00 PM

- ● Teleoperating the modeled robot in gazebo world
- ● General information about the many types of sensors that are used in robotics systems including cameras, IMU, encoders, and more.
- ● A brief tour of 3D sensors used in robotics

Lunch break

2:00-3:30 PM

- ● Intro to the localization concept
- ● Intro to the Mapping and SLAM concepts
- ● Intro to Path planning and Navigation

15 minutes break

3:45-5:15 PM

- ● Teleoperating turtlebot in real world
- ● Implementing Localization, Mapping, and Navigation on turtlebot
- ● Q&A session

To do installations for workshop: Please follow the instructions here for the installations before coming for the workshop

16th – 18th December 2022 || **Venue: CAD Lab, Ground Floor AB - 1**

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