

Building Autonomous Systems with ROS

Course Objectives

This course offers an in-depth exploration of ROS (Robot Operating System), covering everything from setting up a Linux environment and ROS basics to advanced topics like URDF modelling and simulation using RViz and Gazebo. Students will learn to create and manage robot systems, simulate environments, and handle data and messaging within the ROS ecosystem.

Target Audience:

- Robotics developers
- Engineers transitioning to ROS
- Students interested in autonomous systems
- Intermediate developers with basic Python knowledge

About the Course

Number of Hours: 24

Mode of Study: In-person (4 Days) or Online (2 Weeks, 12 h/w)

Location: United Kingdom, London 

Pre-requisite: Python programming knowledge is preferred for this training

Course Description

- **Introduction to Virtual Machines and Linux:** Set up a virtual machine and install Ubuntu Linux. Master basic terminal commands for ROS development.
- **Overview of ROS Architecture:** Learn ROS architecture: nodes, topics, messages, services, and the master node.
- **Setting Up ROS Environment:** Install ROS, configure .bashrc, and set up Catkin workspaces. Manage workspaces and ROS environments.
- **ROS Command Line Tools:** Master basic ROS commands like roscore, roslaunch, rostopic, and use introspection tools for troubleshooting.
- **Developing ROS Nodes:** Create and manage nodes using Python (rospy). Learn node communication via topic publishing and subscribing.
- **ROS Launch Files and Parameters:** Write launch files to handle multiple nodes, remap topics, group nodes, and pass parameters for flexible execution.
- **URDF Modeling and Xacro:** Build robotic models using URDF and Xacro. Visualize models and their movements in RViz.
- **Simulation with Gazebo:** Run robotic simulations in Gazebo, simulate physical interactions.

Learning Outcomes:

By the end of the training, you will be able to:

- Set up a complete ROS development environment
- Develop ROS nodes and manage node communication
- Create and launch complex robot systems with URDF models
- Simulate robotic systems and visualize data in RViz and Gazebo

Equipment:

You will only need a personal laptop and your enthusiasm.

Why Us?

- ✓ World-class training materials developed by researchers and professionals.
- ✓ Value for money training
- ✓ Courses are based on hands-on activities and real case-studies
- ✓ Educators with over a decade of experience in industry
- ✓ Pre and post training support so you feel supported in your journey.

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