

Virtual Robotic Laboratory and Learning Materials for ROSin (Uplat)

Inovasyon Muhendislik Education Project

2nd Training Report



Supported by ROSIN - ROS-Industrial Quality-Assured Robot Software Components.
More information: rosin-project.eu



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1. Introduction

15 people participated in the ROS Applied Trainings held in Eskişehir Osmangazi Technopark education room lasting 2 days between 24-25 December. 6 of the participants were students, 3 was project manager and the remaining 6 were from the private sector. The interests of the participants are as follows; Robotics and Computer Vision. 2 participants came from outside of Eskişehir for training.

During the training, participants had an introductory level of Linux and Python training. Apart from this, they have made examples with many ROS applications from beginner to intermediate level. Thanks to these applications, the participants learned about the structure of ROS. The last day of the training ended with the development of integrated applications with ROS and Gazebo, real robot mapping, use of the robot arm, visualization of the robot and the environment, and the realization of the navigation package. As the feedback from the participants, they were very pleased with the ROS applications and Q & A activity. Based on the feedback from the previous training, the Linux section was organized and the details were removed from the training.

ROS PRACTICAL TRAINING

2019



Training Date
December 24-25, 2019



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TRAINING SCHEDULE



1st DAY - 1st Session: Introduction

09:00-09:45 Introduction and Meeting People
10:00-10:45 The current situation in mobile robot and autonomous vehicle studies
11:00-11:45 Autonomous robot intelligent control architectures, software tools, interface
12:00-13:00 Lunch Break

1st DAY - 2nd Session: Linux ve ROS Basics

13:00-14:45 Installation and Deployments, Linux Basics for ROS, ROS Structure: Node, Topic, Publisher, Subscriber
15:00-18:00 ROS Applications: ROS Environment Preparation, Catkin Package Creation, TurtleSim Application, ROS Message Creation, Publisher & Subscriber Application, Service & Client Application

2nd DAY - 1st Session: ROS Applications

09:00-09:45 GAZEBO Introduction Level Applications: Creating Environment Models, Building a Mobile Robot Model
10:00-12:00 Interaction between ROS-GAZEBO and Sample Applications
12:00-13:00 Lunch Break

2nd DAY - 2nd Session: Applications on Mobile Robot / Autonomous Transportation Vehicle (ATV) / Robot Arm

13:00-14:45 Introduction of Mobile Robot / ATV / Robot Arm Components, Sensor Reading of Mobile Robot / ATV / Robot Arm, Sensor data Visualization in RVIZ
16:00-18:00 Mobile Robot / ATV / Robot Arm Applications: Media Mapping with Mobile Robot / ATV, Autonomous Navigation with Mobile Robot / ATV Application on Robot Arm

2. Second Education



2.1 First Day of Training

On the first day of the training, Dr. Uğur YAYAN talked about the current situation in the Robot and Autonomous Vehicle studies and mentioned the studies carried out in Eskişehir in these fields. R&D Engineer Didem ÖZÜPEK TAŞ has covered autonomous robot control architectures, software tools and middlewares. After completing the "Linux History and Distributions", "Linux File Structures", "Code Development and Compilation in Linux" trainings, "Introduction to Python and Applications" training was given by Dr. Uğur YAYAN. ROS training was given by R&D Engineer Didem ÖZÜPEK TAŞ. In the ROS training, informations about the installation and distributions are provided. The necessary Linux information for ROS is explained again. Node, Topic, Msg, Srv structures and Publisher-Subscribe, Service-Client structures of ROS are explained practically. In addition to this, preparation of ROS environment, structure and creation of catkin, TurtleSim applications were explained to the participants.







2.2 Second Day of Training

On the second day of training Gazebo training was given by Dr. Uğur YAYAN. He gives to participants examples of creating entry-level models and environments in Gazebo and demonstrates the interaction between ROS and Gazebo. Training about the application on Kawasaki Robot Arm and visualization in Rviz was given by R&D Engineer Didem ÖZÜPEK TAŞ. Then again by R&D Engineer Didem ÖZÜPEK TAŞ gave general information about Mobile Robots and Autonomous Carriers. On the ATV (Autonomous Carrier Vehicle), mapping the environment using the Navigation Stack package and using the extracted map to move the ATV autonomously, visualizing the laser data were performed. Finally, the questions of the participants were answered and the training was ended.



