

Virtual Robotic Laboratory and Learning Materials for ROSin (Uplat)

Inovasyon Muhendislik Education Project

4th Training Report



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



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DOKÜMAN REVİZYON SAYFASI

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1. Introduction

Due to Covid-19 disease situations and precautions, 4th ROS applied training also held in online platform. ROS applied Training is held 2 days between June 1-2 and total 17 people have attended This training. Participants from various sectors have participated this education. participants are consist of 14 project managers & engineers 2 students and 1 private sector representative. These Participants were willing to learn more about Linux, robotics and ROS.

Participants with having introductory level of programming and Linux skills are selected. Some participants had experience on ROS varying beginner to intermediate level. With ROS applied trainings begginners have learned ROS structure, Algorithms, libraries and packages for mapping, localization and detection. Intermediate level participants have improved their knowledge with these trainings. In the second day of training, courses for integrated applications with ROS and Gazebo, real time robot mapping, robot arm control and realization of the navigation package is held. As Done in previous meetings, the Linux and python section was organized and the details were removed from the training. Lastly in Q&A section part participants asked their questions and trainers answered these questions.

ROS PRACTICAL TRAINING

2020



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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
15:00-16:00 ROS Applications: ROS Environment Preparation, Catkin Package Creation, TurtleSim Application, ROS Message Creation, Publisher & Subscriber Application, Service & Client Application

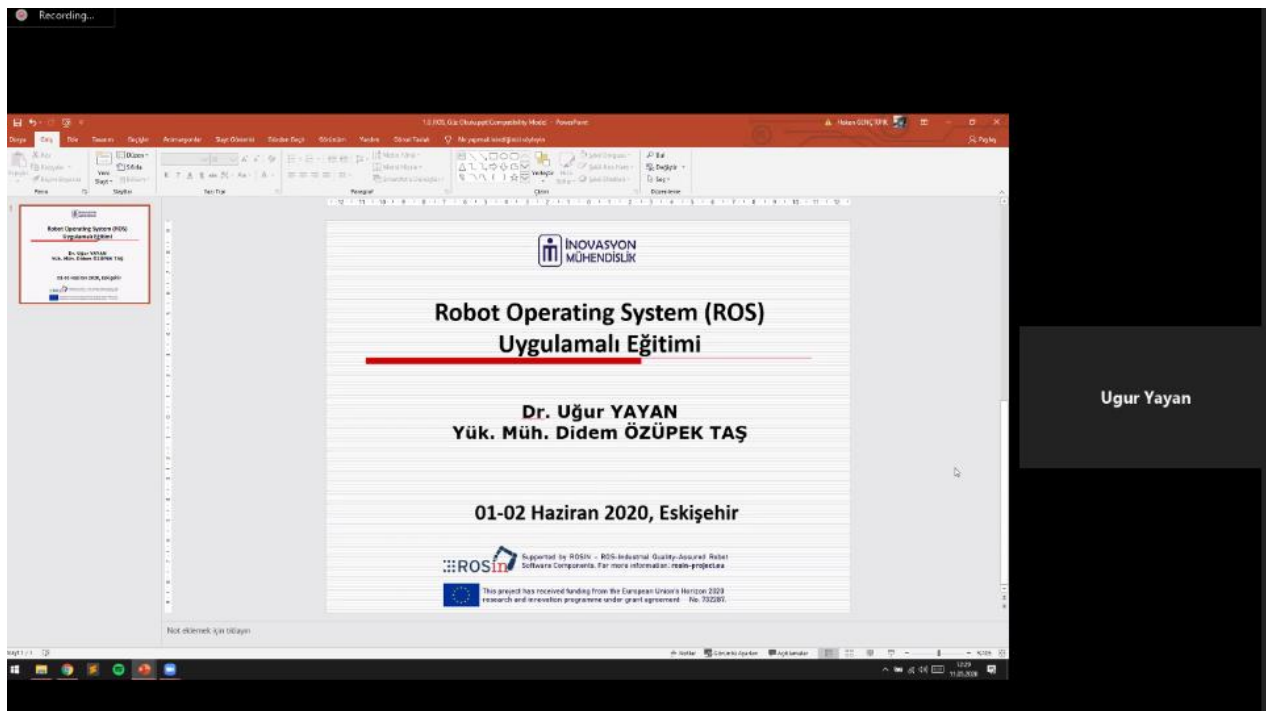
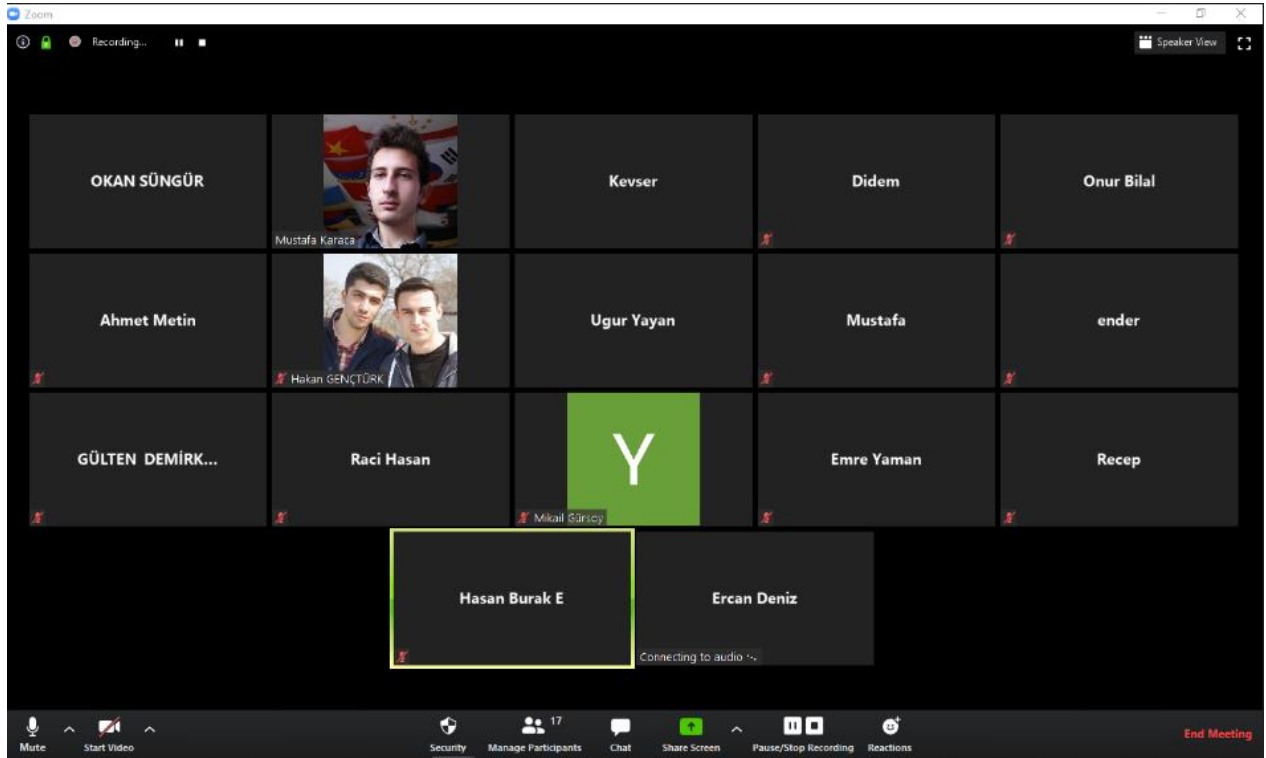
2nd DAY - 1st Session: ROS Applications

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

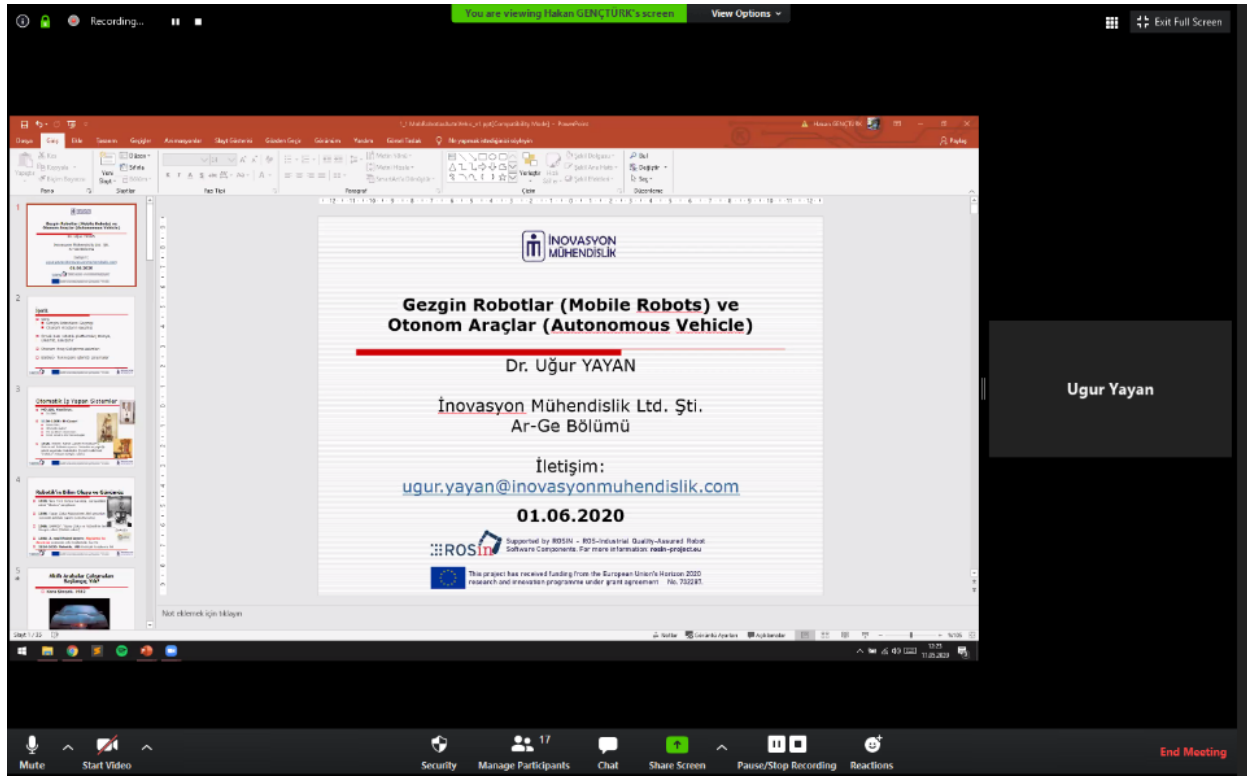
13:00-14:45 Introduction of Mobile Robot / ATV / Robot Arm Components, Sensor Reading of Mobile Robot / ATV / Robot Arm, Sensor data Visualization in RVIZ
16:00-18:00 Mobile Robot / ATV / Robot Arm Applications: Media Mapping with Mobile Robot / ATV, Autonomous Navigation with Mobile Robot / ATV Application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

2. Fourth Education



2.1 First Day of Training

Firstly Dr.Uğur YAYAN introduced development of robot and autonomous systems in the first day of the ROS applied trainings. Existing technologies and latest studies in robotic technology carried out in Eskişehir. At next, "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. On the other side, R&D Engineer Didem ÖZÜPEK TAŞ has covered autonomous robot control architectures, software tools and middlewares. ROS training section also covered by Didem ÖZÜPEK TAŞ. In the ROS training, the installation and distributions informations are explained. Only necessary Linux information for ROS is explained without complicating commands. Node, Topic, Msg, Srv structures and Publisher-Subscribe, Service-Client structures of ROS are explained. In addition, ROS environment creation, preparation of structure and creation of catkin, TurtleSim applications were explained to the participants.



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Recording...

GAZEBO

SUMO

Dijital İkiz ortamlar

ROS

İNNOVATION

OKAN SÜNGÜR

Mustafa

ender

GÜLTEN DEMİR...

Y

Mikail Örsöy

Emre Yaman

Recep

Recording...

You are viewing OKAN SÜNGÜR's screen

Speaker View

Exit Full Screen

Soru & Cevap

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ROS

İNNOVATION

GÜLTEN DEMİR...

Y

Mikail Örsöy

Emre Yaman

Recep

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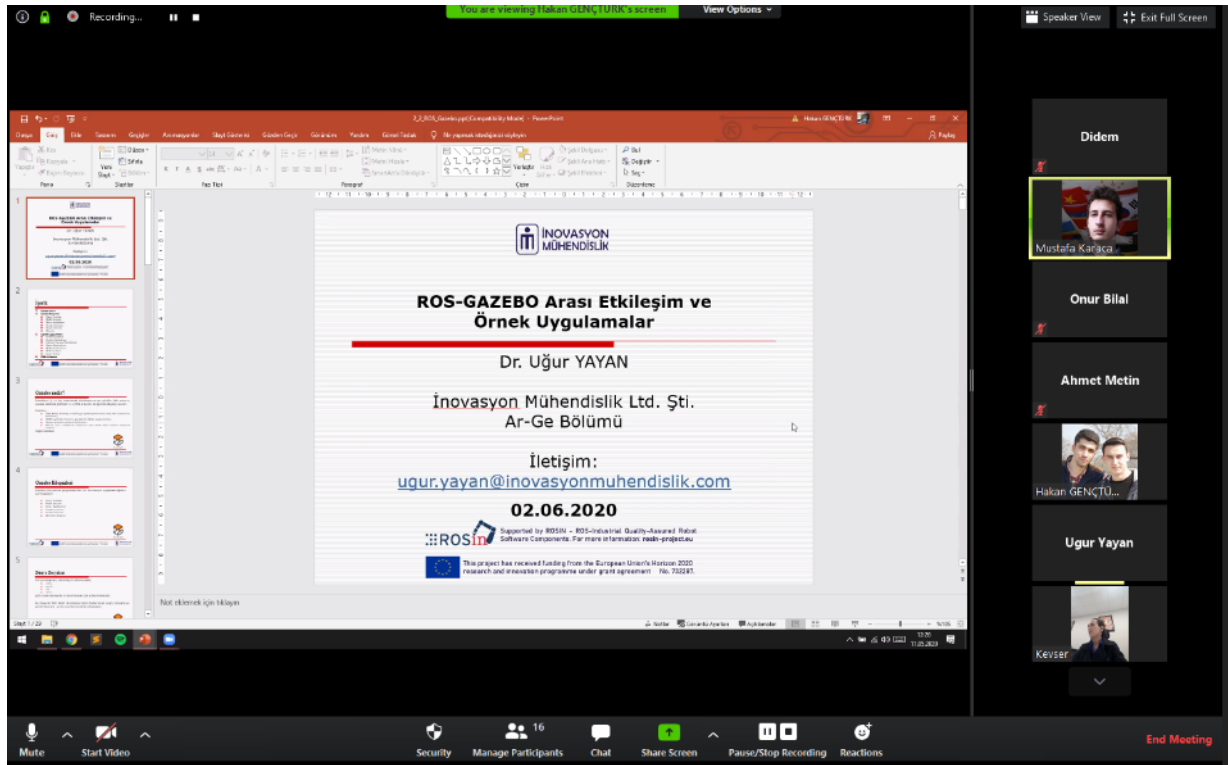
Ercan Deniz

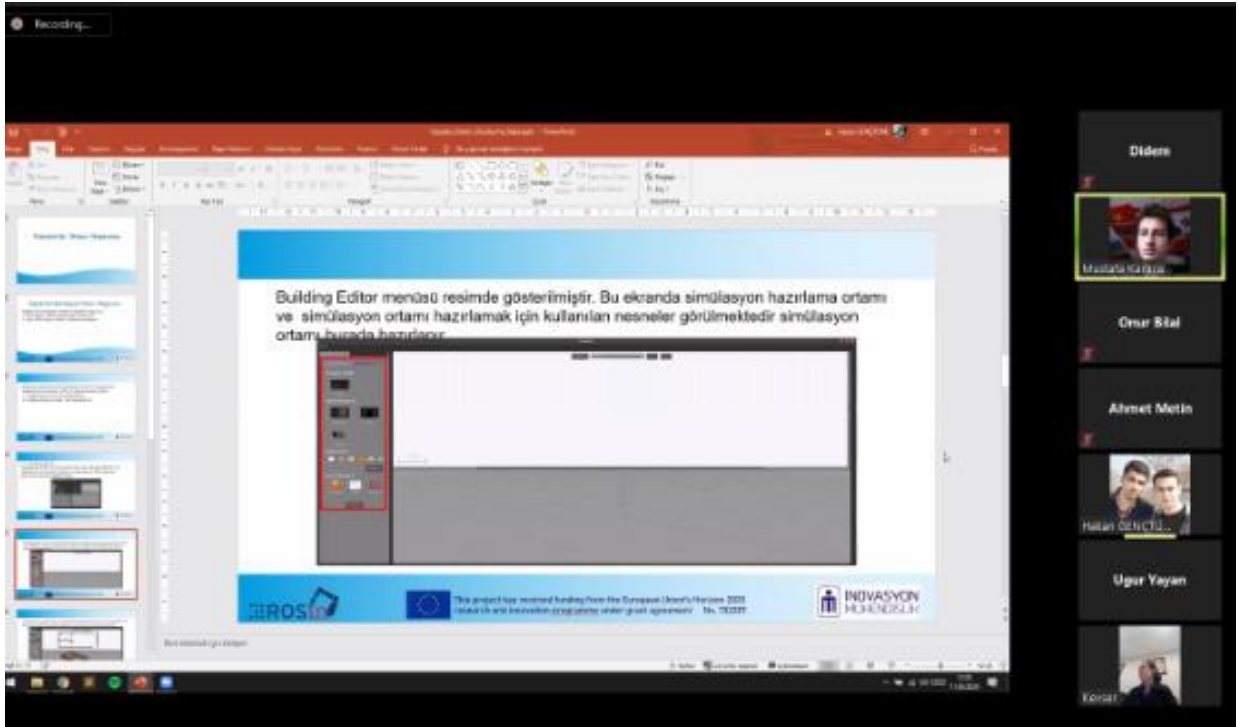
Betül Korkmaz

End Meeting

2.2 Second Day of Training

Dr. Uğur YAYAN started second day training with Gazebo-ROS interactions and sample applications. He gave examples of creating entry-level models and environments in Gazebo and demonstration the interaction between ROS and Gazebo to participants. Robot arm motion planning with 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. At the end of the section, Q&A about second day topics are held. After Q&A fourth ROS applied trainings course is finished.





Recording...

Building Editor menüsü resimde gösterilmiştir. Bu ekranda simülasyon hazırlama ortamı ve simülasyon ortamı hazırlamak için kullanılan nesneler görülmektedir simülasyon ortamı burada hazırlanır.

INOVASYON MÜHENDİSLİK

Didem

Mustafa Karaca

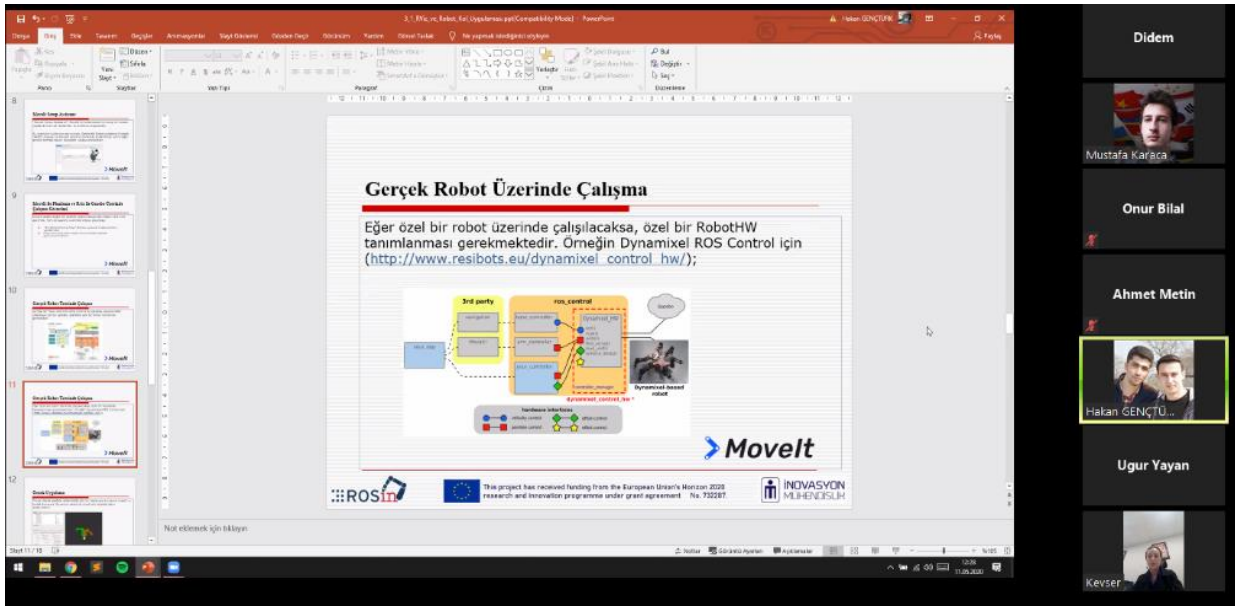
Onur Bilal

Ahmet Metin

Hakan GENÇTÜ...

Uğur Yayan

Kevser



Gerçek Robot Üzerinde Çalışma

Eğer özel bir robot üzerinde çalışılacaksa, özel bir RobotHW tanımlanması gerekmektedir. Örneğin Dynamixel ROS Control için (http://www.resibots.eu/dynamixel_control_hw/);

ROS

MoveIt

INOVASYON MÜHENDİSLİK

Didem

Mustafa Karaca

Onur Bilal

Ahmet Metin

Hakan GENÇTÜ...

Uğur Yayan

Kevser