

Virtual Robotic Laboratory and Learning Materials for ROSin (Uplat)

Inovasyon Muhendislik Education Project

3rd Training Report



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



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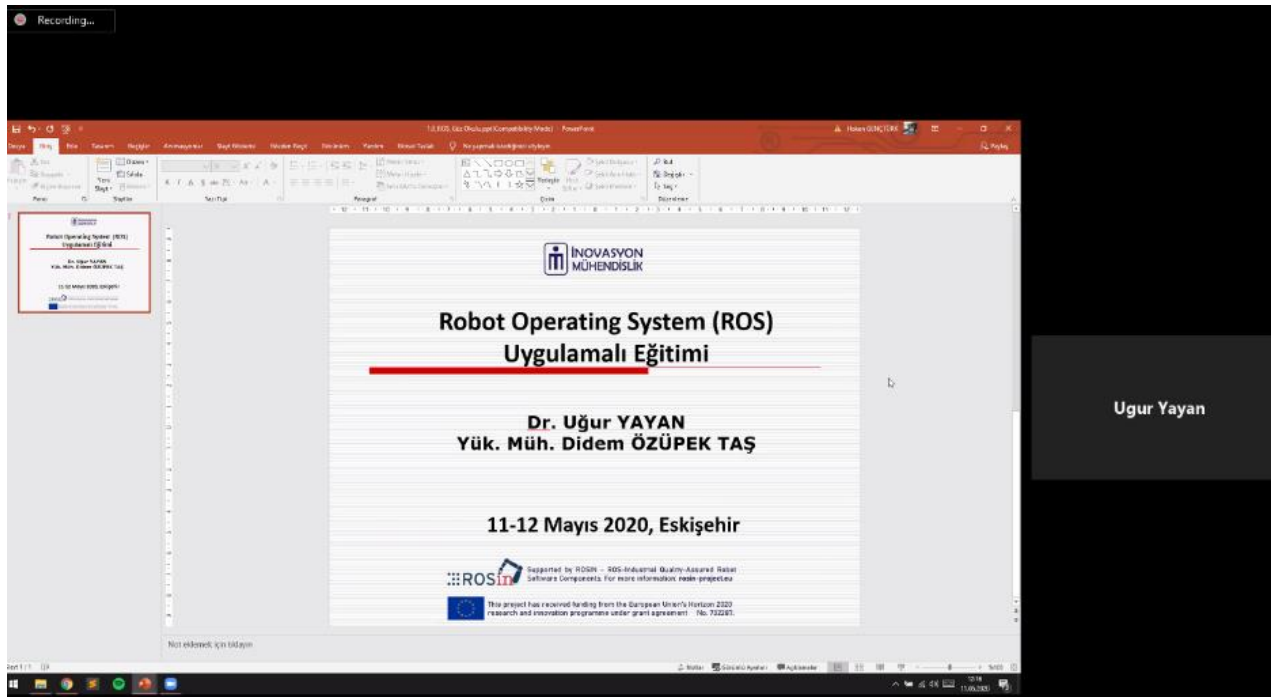
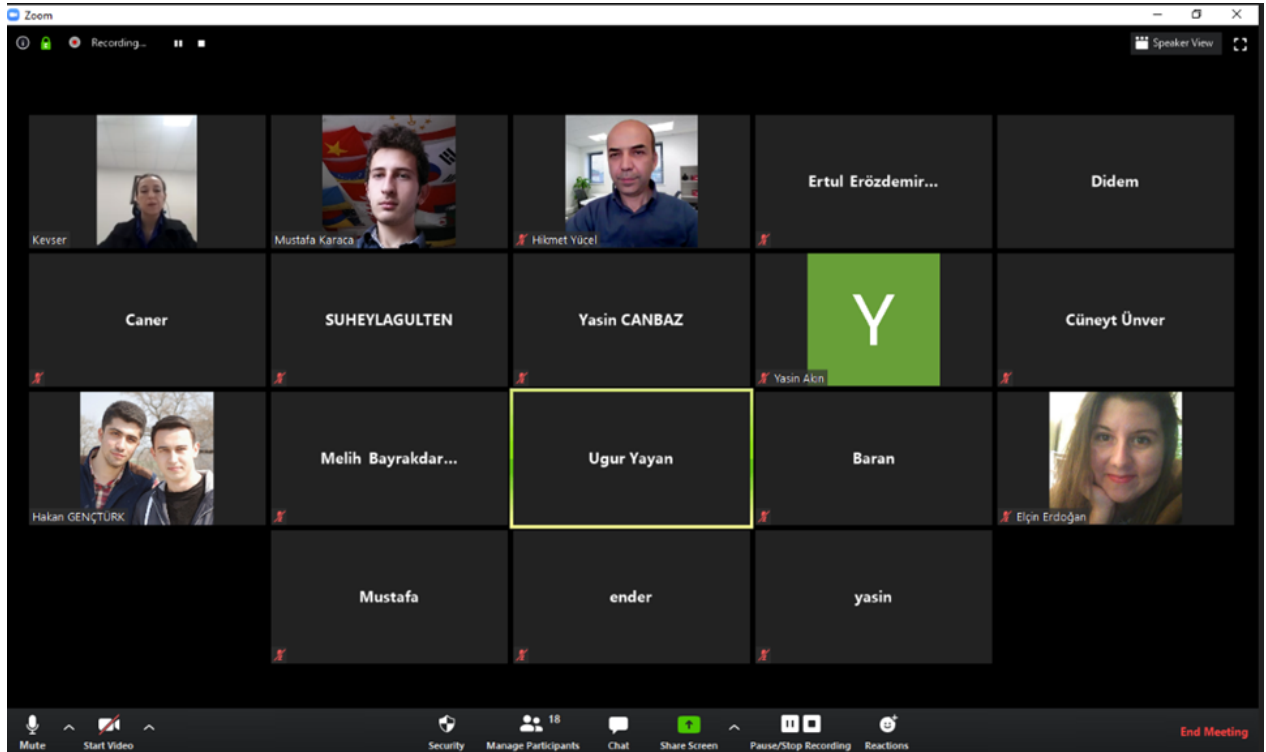
DOKÜMAN REVİZYON SAYFASI

REV. NO	TARİH	SAYFA NO.	AÇIKLAMA
1.0	-	-	İlk versiyon

İçindekiler

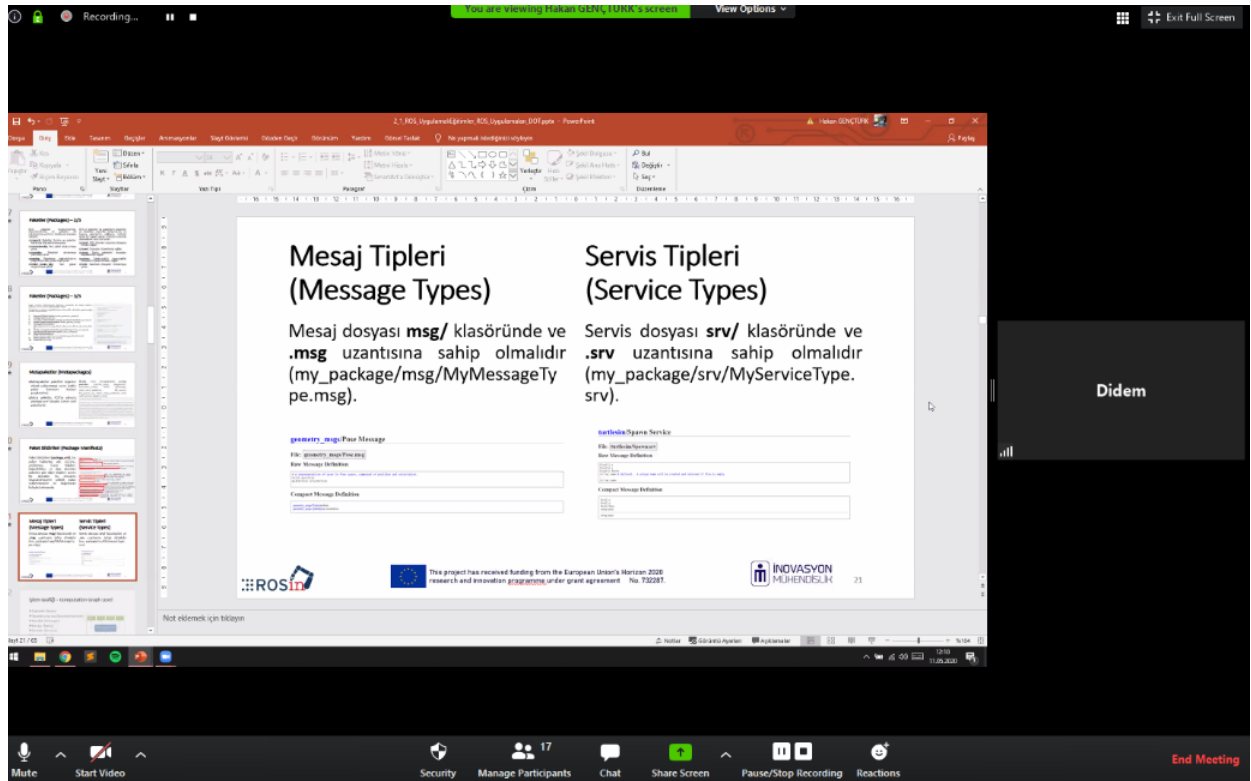
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2. Third Education



2.1 First Day of Training

First day of the ROS applied trainings started with Dr.Ugur YAYAN introduced development of robot and autonomous systems. He indicated current studies and mentioned studies carried out in Eskişehir in robotic technology. At next, after "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. 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, 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.

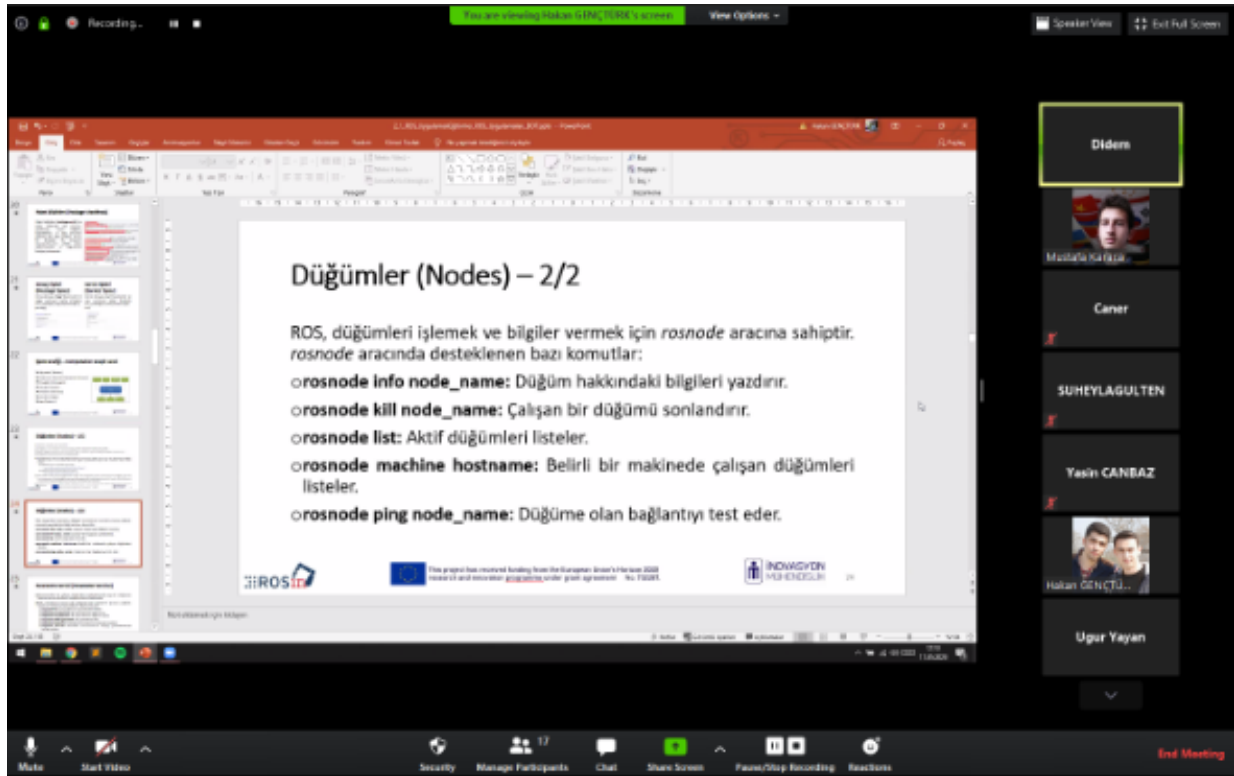


The screenshot shows a Zoom meeting interface. The main window displays a presentation slide with the following content:

Mesaj Tipleri (Message Types)	Servis Tipleri (Service Types)
Mesaj dosyası msg/ klasöründe ve .msg uzantısına sahip olmalıdır (my_package/msg/MyMessageType.msg).	Servis dosyası srv/ klasöründe ve .srv uzantısına sahip olmalıdır (my_package/srv/MyServiceType.srv).

Below the text, there are two code editors showing the structure of a ROS package. The left editor shows the 'msg' directory structure, and the right editor shows the 'srv' directory structure. The bottom of the slide features the ROS logo, a European Union funding notice, and the 'İNOVASYON MÜHENDİSLİK' logo.

The Zoom meeting controls at the bottom show 17 participants, a chat window, and a red 'End Meeting' button.



Düğüm (Nodes) – 2/2

ROS, düğümleri işlemek ve bilgiler vermek için *roscnode* aracına sahiptir. *roscnode* aracında desteklenen bazı komutlar:

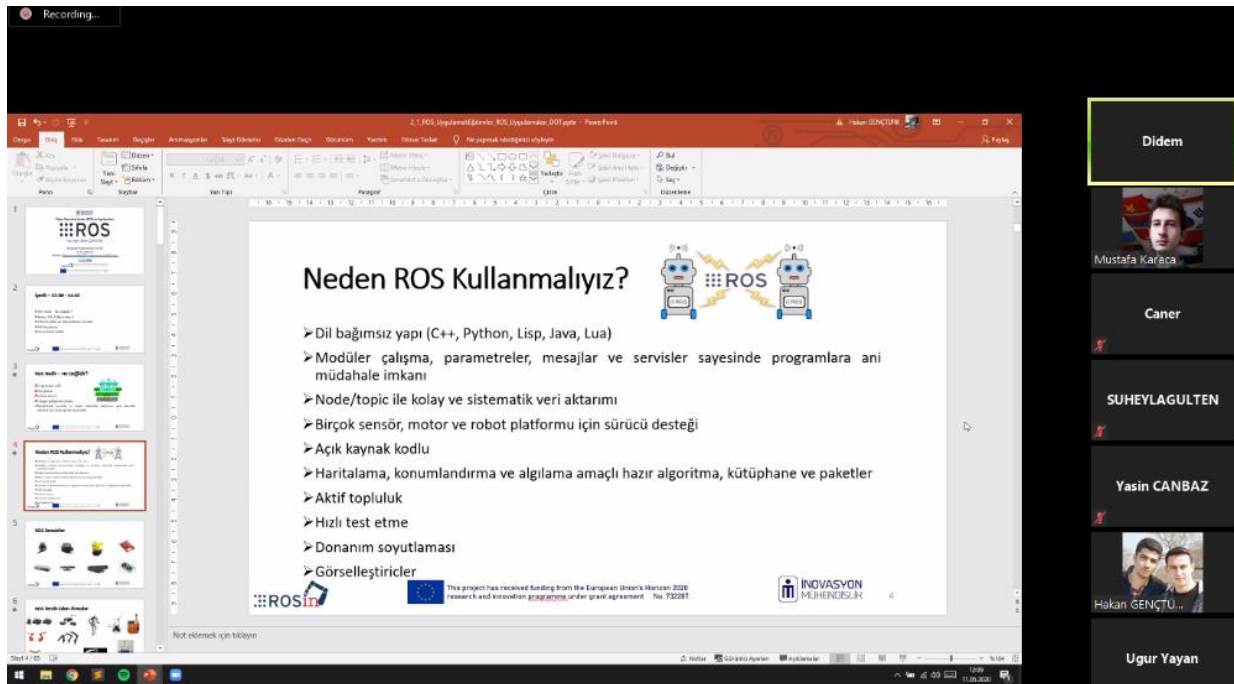
- o *roscnode info node_name*: Düğüm hakkındaki bilgileri yazdırır.
- o *roscnode kill node_name*: Çalışan bir düğümü sonlandırır.
- o *roscnode list*: Aktif düğümleri listeler.
- o *roscnode machine hostname*: Belirli bir makinede çalışan düğümleri listeler.
- o *roscnode ping node_name*: Düğüme olan bağlantıyı test eder.

ROS İTİP

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 732081.

INOVASYON MÜHENDİSLİK

Participants: Didem, Mustafa Karaca, Caner, SUHEYLAGULTEN, Yasin CANBAZ, Hakan GENÇTÜRK, Ugur Yayan



Neden ROS Kullanmalıyız?

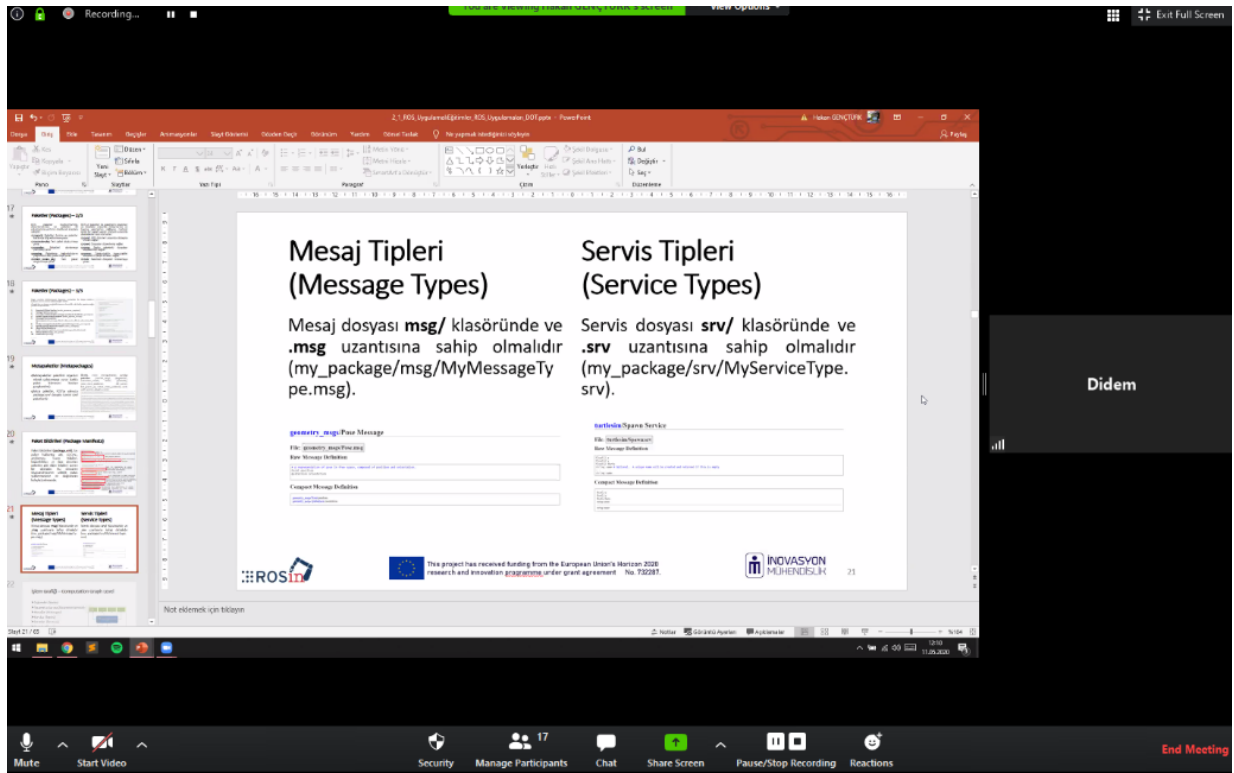
- Dil bağımsız yapı (C++, Python, Lisp, Java, Lua)
- Modüler çalışma, parametreler, mesajlar ve servisler sayesinde programlara ani müdahale imkanı
- Node/topic ile kolay ve sistematik veri aktarımı
- Birçok sensör, motor ve robot platformu için sürücü desteği
- Açık kaynak kodlu
- Haritalama, konumlandırma ve algılama amaçlı hazır algoritma, kütüphane ve paketler
- Aktif topluluk
- Hızlı test etme
- Donanım soyutlaması
- Görselleştiriciler

ROS İTİP

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INOVASYON MÜHENDİSLİK

Participants: Didem, Mustafa Karaca, Caner, SUHEYLAGULTEN, Yasin CANBAZ, Hakan GENÇTÜRK, Ugur Yayan



Mesaj Tipleri (Message Types)

Mesaj dosyası **msg/** klasöründe ve **.msg** uzantısına sahip olmalıdır (my_package/msg/MyMessageType.msg).

Servis Tipleri (Service Types)

Servis dosyası **srv/** klasöründe ve **.srv** uzantısına sahip olmalıdır (my_package/srv/MyServiceType.srv).

greetings.msg Free Message

```
#!ROS: greeting, type: std_msgs/String
# ROS Message Definition
# This file defines a ROS message type.
# The message type is defined in the package's msg directory.
# The message type is defined in the package's msg directory.
```

hello_srv.srv Service

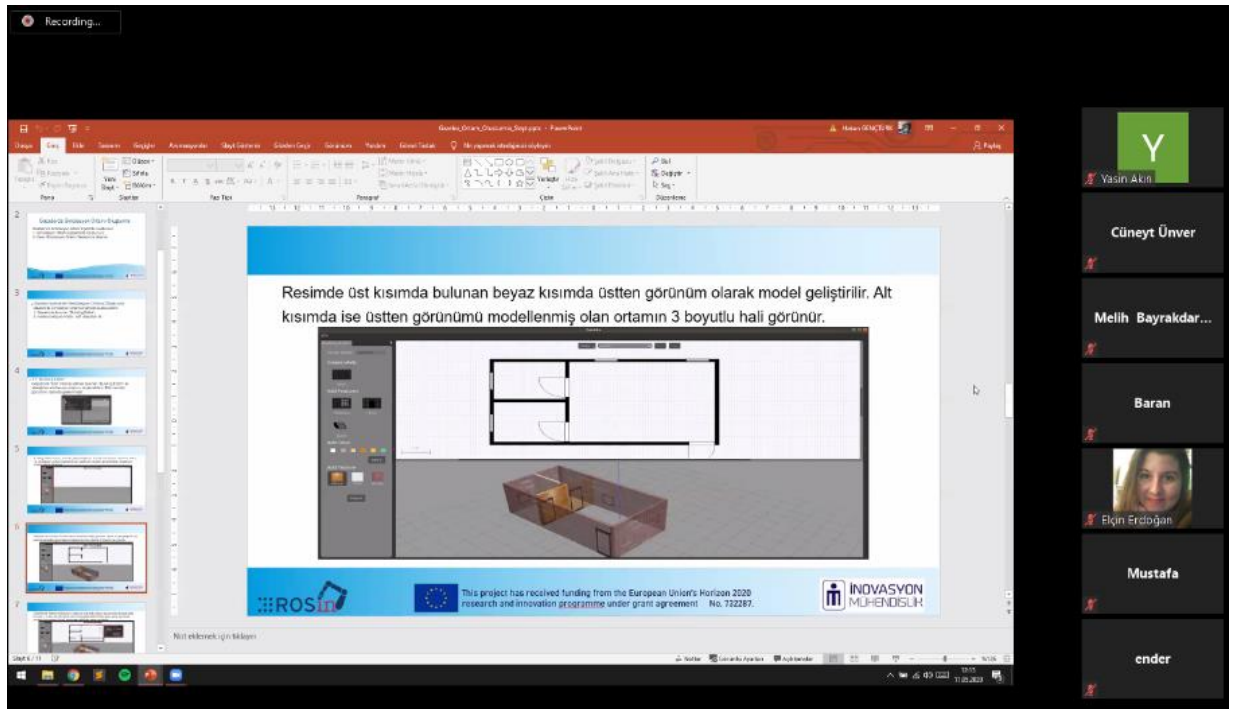
```
#!ROS: hello, type: std_msgs/String
# ROS Service Definition
# This file defines a ROS service type.
# The service type is defined in the package's srv directory.
# The service type is defined in the package's srv directory.
```

ROS INOVASYON MÜHENDİSLİK

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Not eklemek için tıklayın

Zoom Meeting Controls: Mute, Start Video, Security, Manage Participants (17), Chat, Share Screen, Pause/Stop Recording, Reactions, End Meeting.



Resimde üst kısımda bulunan beyaz kısımda üstten görünüm olarak model geliştirilir. Alt kısımda ise üstten görünümü modellenmiş olan ortamın 3 boyutlu hali görünür.

3D model of a room with a white floor and walls, and a brown floor and walls.

ROS INOVASYON MÜHENDİSLİK

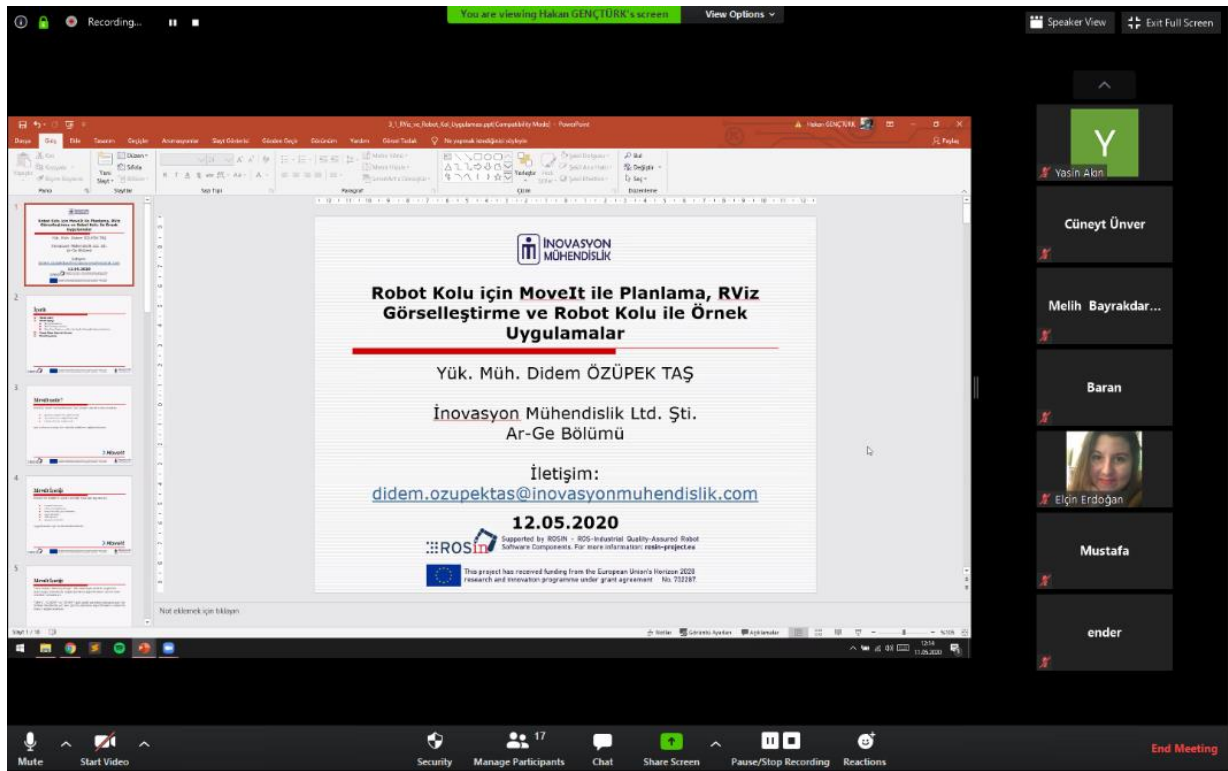
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Not eklemek için tıklayın

Zoom Meeting Controls: Recording, Participants List (Yasin Akın, Cüneyt Ünver, Melih Bayrakdar..., Baran, Elçin Erdoğan, Mustafa, ender).

2.2 Second Day of Training

Second day is started with Gazebo training given by Dr. Uğur YAYAN. He gave examples of creating entry-level models and environments in Gazebo and demonstration the interaction between ROS and Gazebo to participants. Training about robot arm motion planning with Kawasaki Robot Arm and visualization motions 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, At the end of the day Q&A application is held and third ROS applied trainings is completed.



The screenshot shows a Zoom meeting interface. The main window displays a presentation slide titled "Robot Kolu için MoveIt ile Planlama, RViz Görselleştirme ve Robot Kolu ile Örnek Uygulamalar" (Planning, RViz Visualization and Example Applications for Robot Arm with MoveIt). The slide is presented by Yök. Müh. Didem ÖZÜPEK TAŞ from İnovasyon Mühendislik Ltd. Şti. Ar-Ge Bölümü. The contact email is didem.ozupektas@inovasyonmuhendislik.com and the date is 12.05.2020. The slide also mentions ROS and ROS-Industrial Quality-Assured Robot Software Components. On the right side of the Zoom window, there is a list of participants: Yasin Akın, Cüneyt Ünver, Melih Bayrakdar..., Baran, Elçin Erdoğan, Mustafa, and ender. The bottom of the Zoom window shows various controls like Mute, Start Video, Security, Manage Participants, Chat, Share Screen, Pause/Stop Recording, Reactions, and End Meeting.

