Introduction to Robot Operating System (ROS)

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I. Slide 1: Outine

Hi every one my name is Amr Elhussein, mechanical enginering graduate student, i've been interested in working in robotics for four years now and i want to thank Dr. Miah to give me the chance to finally work in the field. In today's presentaion we will be talking about ROS, we will talk a litle bit about its origin, how was things done before ros, what ROS exactly is and some applications. We will also walk through major concepts in ROS, how to install it and an overview on the future of ROS.

II. Slide 2: Historiccal Background

ROS started in 2007 as an outgrowth of Stanford AI robot (STAIR) and lately sponsored by willow grage a robotics incubator. Ros is Currently extensively used in academia and industry. Currenlty ROS is supported by what is known as open source robotics foundation.

III. Slide 3: Robot programming before ROS

Before ROS developing robots was very time consuming because there were no common platform for doing so. instead developers built every thing from scratch and implement algorithms on their own.

IV. Slide 4: ROS is

A flexible framework for writing robot software. It is a collection of tools, libraries, and conventions that aim to simplify the task of creating complex and robust robot behavior across a wide variety of robotic platforms.

V. Slide 5: ROS Equation

To get more understanding of ROS, we can say that ROS is a combination of plumbing which are used to connect different parts of the robot, tools that are used in visualisation and other tasks one example of those tools is Gazebo which is a 3D visulisation tool used to simulate real world enviroments, Capabilities such as of the shelf algorithms that are ready to reuse and Ecosystem and community support which is an essential component of ROS.

VI. Slide 6: Applications

As we mentioned earlier ROS is widely used in so many areas that includes : autonomus vehicles , warehouses and industrial applications. ROS also has been used to train robotics teams in First Robotics high school competion.

VII. Slide 7: ROS Concepts, File System

When using ROS there are three levels of concepts one must deeply understand, the first level is the filesystem which consists of:
Packages: the atomic unit of ROS which contains executable and supporting files that serve a specific purpose.
metapackages : which serves to represent a group pf related other packages.