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EMBEDED SYSTEM

ROS Presentation Report

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1 Definition

ROS is an open-source, meta-operating system for your robot. It provides the services you would expect from an operating system, including hardware abstraction, low-level device control, implementation of commonly-used functionality, message-passing between processes, and package management. It also provides tools and libraries for obtaining, building, writing, and running code across multiple computers. ROS is similar in some respects to 'robot frameworks,'

The ROS runtime "graph" is a peer-to-peer network of processes (potentially distributed across machines) that are loosely coupled using the ROS communication infrastructure. ROS implements several different styles of communication, including synchronous RPC-style communication over services, asynchronous streaming of data over topics, and storage of data on a Parameter Server.

FROS is not a realtime framework, though it is possible to integrate ROS with realtime code. The Willow Garage PR2 robot uses a system called pr2$_e therCAT, which transports ROS messages in and out of a realtin$ $time Toolkit$.

2 Available Operating System

ROS currently only runs on Unix-based platforms. Software for ROS is primarily tested on Ubuntu and Mac OS X systems, though the ROS community has been contributing support for Fedora, Gentoo, Arch Linux and other Linux platforms.

While a port to Microsoft Windows for ROS is possible, it has not yet been fully explored.

The core ROS system, along with useful tools and libraries are regularly released as a ROS Distribution. This distribution is similar to a Linux distribution and provides a set of compatible software for others to use and build upon.

3 Properties and Prospects

ROS is very flexible and useful for the modern era with its ease-of-use and generally friendly approach to building a project. The open-source nature of the ROS system also make it extremely popular. The whole package makes it very easy for people to create and implement their own robot system.

The Peer to Peer system does a great job in making sure the system is modular for easy customization and maintenance which is very important for modern science. The ROS wiki also provides a simple and comprehensive source of data to help us solve any problems we encounter while building our robotic system.

Due to the popularity and open source nature of ROS, there is a strong community backing the project.

With the future focusing on automation, ROS is destined to be an important part of computer science. Because of that, learning and mastering ROS is a very important mission for students that aim to pursue a career in Computer Science and Engineering.

4 Raising Question

I had found that ROS is not a real-time operating system and the lack of support for real-time system is the major issue of ROS.. Thus is it possible to integrate ROS with real-time code.