

ROS: Robot Operating System is a flexible framework that designed for robot software development.

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.

Its usefulness is not limited to robots, but most tools provided are focused on working with peripheral hardware.

Pros:

1. It was designed very portability, users do not need exchange main frame and system, because the code that is written by ROS can be used in other software framework of robots.
2. Language independent is also an advantage of ROS. The ROS framework is easy to implement in any programming language, such as Python, C++.
3. Simple testing

Cons:

1. Not such reliable satisfied with precise industrial requirement.
2. Takes too much time to prepare and perform the same high level movements (like welding) that a robot can perform while being easily program with its own vendor programming interface.

Junwei Li:

Main part: Introduction, Summary of reference, Function of ROS (SIMULATION YOUR ROBOT, PROCESSES ARE NODES, COMMUNICATING BETWEEN NODES, PROS VS CONS ), Recommendation, Conclusion

1. What is ROS system and analyze the advantage of ROS system and why a robot need this system.
2. How to make a URDF(Unified Robot Description Format) to simulate Robot and the ROS system how to communicate between nodes.
3. Summarize the pros and cons of ROS system (Pos: 1. Multi-lingual 2. Free and open source. 3. Distributed. 4. Start easily. Cons: 1. Not reliable if do precise task. 2. Security and scalability are not first-class concerns. 3. Operation system other than Ubuntu and Linux are not well supported.)
4. this system cannot be used to do out-of-the-box self-driving wheelchair, because ROS cannot simulate so complex and unpredictable outdoor environment. We may need to train wheelchair with tones of picture from API or train it in real environment.

Michael Brunsman:

Main part: Introduction, ROS System, Analysis, Recommendations, Conclusions, References

1. Main function of ROS System and the reasons why people like use this system.
2. he introduces the ROS system can be broken down into three major

components: (Communications Infrastructure, Robot-Specific Features, and Tools) and describes this system how to work.

3. If we had all hardware, the ROS system has enough capable to create a self-driving wheelchair, because the rviz library would be instrumental in this application. Rviz is easy to use and can be run using both a GUI and a command line. These are the two basic libraries and functions that would be needed to create a self-driving wheelchair.

Merlin Hoffman:

Main part: What is ROS? Sources, Pros & Cons, Recommendations, Conclusion

1. ROS is a framework used for writing software for robots. In Sources part, he summarizes the content of three essays about ROS System.
2. Then, he gives us several advantages and disadvantages about this system.  
  
Pros – 1. It is a modular system: It can be summarized that it is much easier to update and try different code in a modular system. 2. Large collaborative community: There are over 3000 packages that be used within the OS. 3. Open source: Anyone can use ROS and its multitude of packages as long as they adhere to the licensing agreements. 4. ROS uses modern programming languages. ROS is compatible with Python, C++, LISP, and there are experimental libraries for Java and Lua. Cons – 1. Higher complexity with large learning curve. 2. Currently only runs on Unix-based platforms. In recommendations part, ROS is a very powerful and flexible framework.

3. This is ideal for cutting edge research and complex systems, but it is not a great framework for everyone though. When working with simple systems or highly focused and specialized systems other OS systems may be better.

Elise DeCarli:

In this report, she introduces the development of robotics' history. Early on, robotics just does some simple tasks that needed to be repeated multiple times with extreme precision, but now people can build robotic elements with dexterity that rivals a human's. Then, she introduces the OpenAI's robotic hand. This hand used artificial intelligence and machine learning to determine how it works. OpenAI was able to broaden the ability of their hand by training it in a multitude of randomized simulations.