Project Motivation & Objectives

This project aims to develop RADOE: Robot Application Development and Operating Environment. RADOE is an open source software that allows easy, convenient and interactive access to controlling industrial robots. It is easy to communicate with different robots, sensors and automation devices. It is typically meant for industrial robots used in manufacturing sector but can be used for other applications.

Advantages:
- A friendly GUI with easy graphic programming capability.
- Easy to communicate with and programming different robots with intermediate language.
- Allow rapid and flexible architecture of widget for further development of value-added robotic modules and customized applications.

Methodology & Results

RADOE is developed using ROS in Ubuntu Linux environment. Its basic modules are built on the base of ROS-Industrial, MoveIt!, Rviz, Gazebo, OpenCV , PCL and other open source packages. It is also an incorporation of high-level robotic software that has been developed in the A*STAR SERC industrial robotics research program for diversified robotics application development.

RADOE is composed of simulation module, interface module, intermediate robot language, drive libraries, and other advanced capability modules.

Application Demos

Automated Robot Items Bin-picking System for E-commerce Warehouse Application

This automated robot bin-picking system is programmed to pick different sized, shaped & materialized objects from a shelf bin and finally placing it properly in an order bin within a limited time period.

- It can pick more than 25 different objects in less than 15 minutes.
- Picking successful ratio > 95%.
- Team Nanyang attended ICRA2015 Amazon Picking Challenge held in Seattle, US.

Sorting out Small Parts with Dual-Arm Industrial Robot for 3C Industry Application

- This dual-arm industrial robot, NEXTAGE, is programmed to do sorting out tasks. It can sort out small objects according to its size and colour.
- The control software is built on RAODE based on object recognition, pose registration, dual-arm manipulation planning and task generation modules.

Publications