Simulation of a Tele-operated Task under Human-Robot Shared Control

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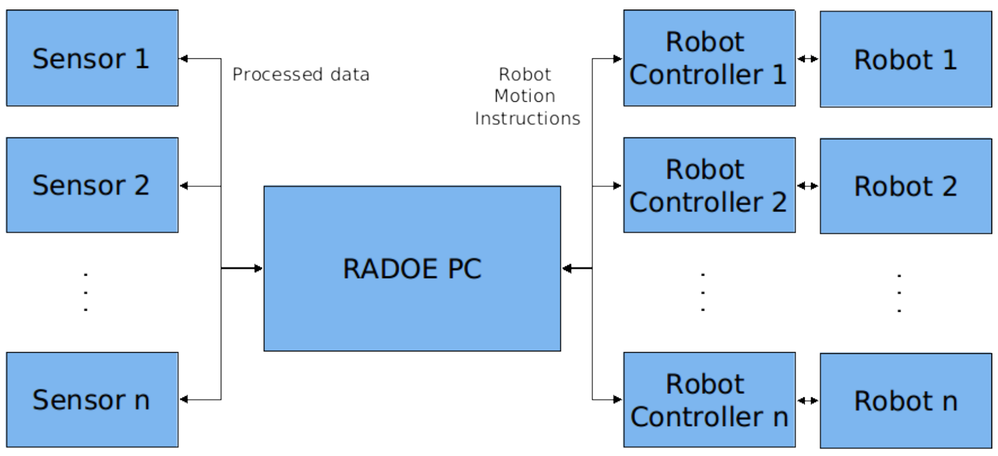
Motivation

To use RADOE (Robot Application Development and Operating Environment), a generic industrial robotics simulator to develop a user-friendly simulation platform for the tele-operated task under human robot shared control

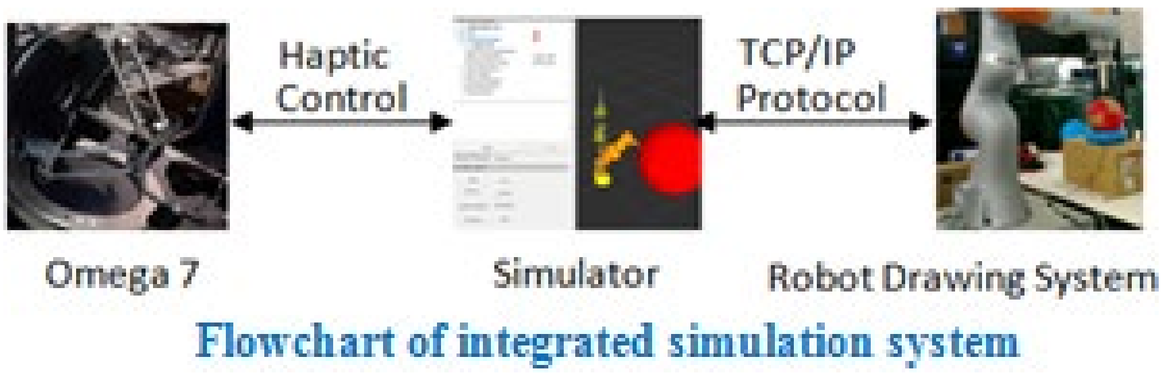
Technology: RADOE integrated with tele-operated robotics drawing task

- Framework that provides well-defined process flow and various tools to aid robot task definition and execution on the tele-operated shared control task
- System enables the user to simulate and execute the remote control of robot drawing task using haptic device
- Architecture allows seamless integration of customized functionalities across multiple platforms

Structure of physical robot drawing system



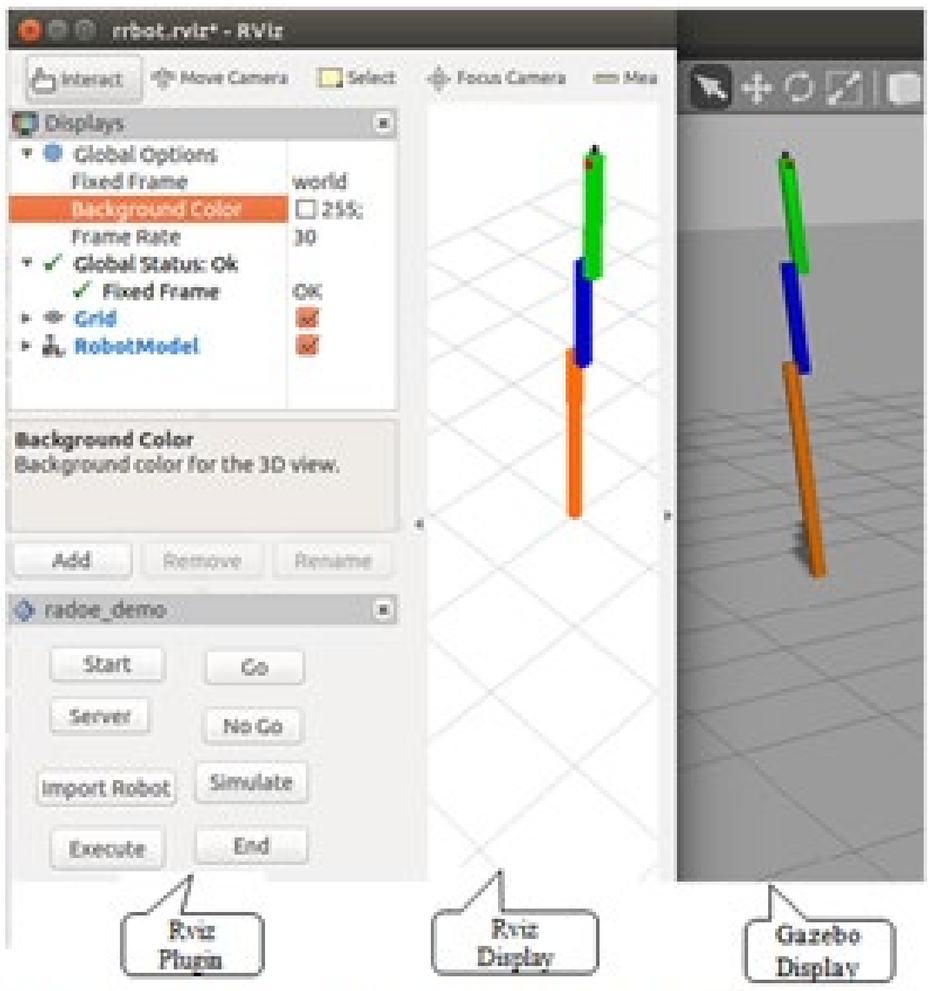
RADOE Architecture



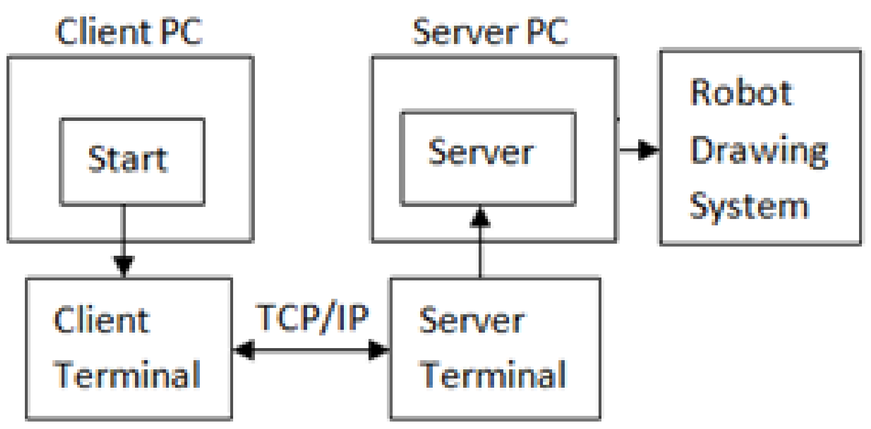
Flowchart of integrated simulation system

Realization

- A customized rviz plugin interface is applied to import robot model, simulate, execute task, communicate with other projects etc
- TCP/IP protocol is built to realize communication between server and client computers



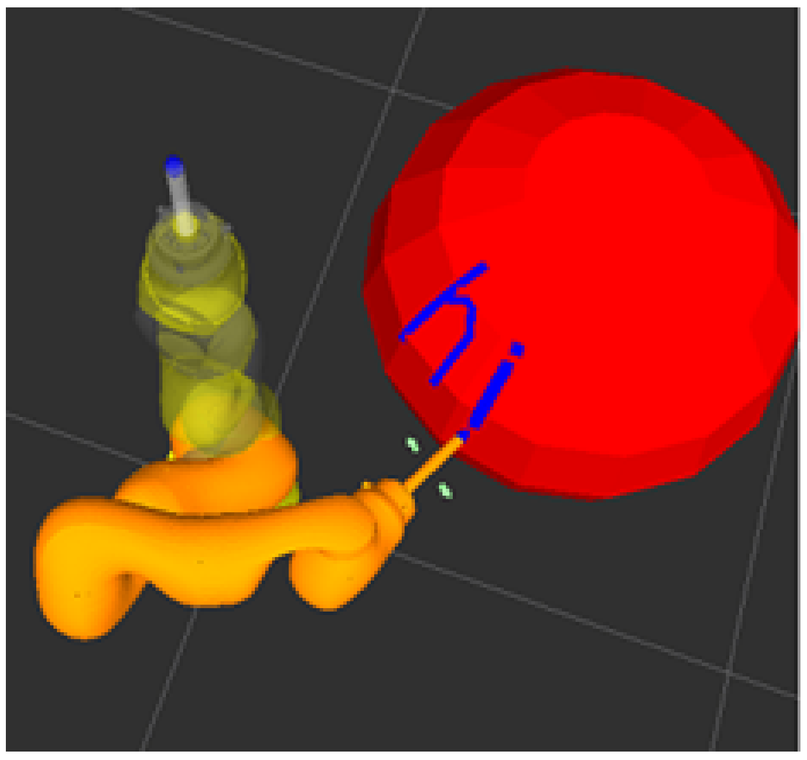
Displays of Rviz and Gazebo with Rviz Plugin interface



TCP/IP Protocol for the robot drawing system

Application

- The simulation platform fulfilled the simulation task of a Kuka robot drawing on the surface of a sphere



Simulation of Kuka drawing task on the surface of a sphere