haptic data reduction for position-position teleoperation control architecture

Using a teleoperation system with haptic feedback, the users can thus truly immerse themselves into a distant environment, i.e., modify it, and execute tasks without physically being present but with the feeling of being there. A typical teleoperation system with haptic feedback (referred to as a teleoperation system) comprises three main parts: the human operator OP/master system, the teleoperator (TOP)/slave system, and the communication link/network in between. During teleoperation, the slave and master devices exchange multimodal sensor information over the communication link. This work aims to develop a haptic data reduction scheme based on a position-position teleoperation architecture and compare the performance with the classical position-force control architecture.

Your work:

(1) build up a teleoperation system that can switch between position-position and position-force architectures.

(2) integrate the existing haptic data reduction scheme with the PP architecture.

(3) introduce delays, and implement existing passivity based control scheme to ensure system stability

(4) compare the performance difference between the PF and PP architectures.

Prerequisites

C++, matlab simulink

Advisors

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