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Title: A high fidelity telepresence and teleaction system

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Abstract:
Telepresence offers considerable advantages in the remote execution of maintenance assignments. In this talk an advanced dual-handed, mobile telerobotic system developed at the High-Fidelity Telepresence and Teleaction Research Centre, Munich, Germany will be presented. The system allows performing assembly taks in remote and extensive environments and consists of two redundant human-scaled anthropomorphic telemanipulator arms controlled by two redundant haptic interfaces providing a large, convex workspace and force feedback in a wide range of human perception. To provide a multi modal immersion, the haptic modality is augmented by 3D visual and audio channels. The main research issues, the control of devices with dissimilar kinematics as well as redundancy resolution methods and six DOF compliance control, will be addressed. To extend the accessible workspace in remote environments, mobile robots are used as transporting platform extending the functionality of both the input devices and the telerobot. The motion compression concept is exploited to cover excessive remote environments on a relatively small local area. Finally mechatronic design topics and experimental results of six degree of freedom telemanipulation tasks and mobile telemanipulation are presented.