

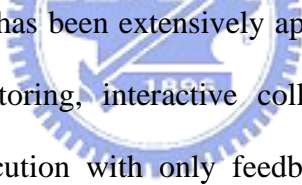
Design of Teleoperation System with Bilateral Interactive Force Feedback

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Abstract



Teleoperation technology has been extensively applied in various fields, such as remote vehicle control, remote monitoring, interactive collaboration, etc. Some of them have limitations in training or execution with only feedbacks of vision and sound. A critical improvement is to include the sense of touch over network, also known as telehaptics. In this thesis, we have developed a teleoperation system with bilateral interactive force feedback, using two force feedback joysticks. Users in two different locations can virtually interact with each other by via the joystick. The teleoperation system is composed of a master system, placed in a local site, and a slave system, which is placed in a remote site. We use the Internet as a command transmission medium and adopt the TCP/IP protocol. The important issues in this teleoperation system are discussed, including the hardware structure, software design, system analysis, and signal flow. Finally, experiments are performed to demonstrate the effectiveness of the proposed system.