

# Robust Control of Interaction with Haptic Interfaces

<sup>1</sup>Dragoljub Surdilovic, <sup>1</sup>Jinyu Zhang, <sup>1</sup>Rolf Bernhardt

<sup>1</sup>Fraunhofer Institute for Production Systems and Design Technology (IPK)  
Pascalstraße 8-9, D-10587 Berlin, Germany  
dragoljub.surdilovic@ipk.fraunhofer.de

## Abstract

The primary concern in haptic systems is to achieve stable interaction under any operating conditions and for all simulated virtual environments, without unwanted oscillation that degrade virtual surface rendering. This paper represents novel approach for controlling interaction with a haptic interface based on robust control design framework established for the control synthesis of interaction between a impedance-controlled robot and a passive environment. Initial experiments results have demonstrated advantages, high performance in interaction with a very stiff environment and reliability of the new algorithms.