MULTIMODAL HAPTICS FOR IMPROVED SAFETY IN ROBOTIC SURGERY

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Abstract:
The addition of haptic and tactile feedback in teleoperated robotic systems is a hot topic. Up to now, it has not been possible to prove any clinical benefits from haptics. However, it seems that in several situations the addition of haptics could improve performance and reduce the risk of accidents. Surgical experience allows a surgeon to estimate the magnitude of the applied forces by visual assessments of tissue deformation. Nevertheless, many situations are conceivable in which this estimate of tissue interaction force is not sufficient: when the surgeon is a novice, when the robotic tools are out of the field of view or when the surgeon is operating on a bone. We propose a concept based on multimodal feedback consisting of the integration of different kinds of audio, visual and tactile cues with force feedback that can potentially improve both the performance of the surgeon and the safety of the patient.

Publications: