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Abstract**Full text links**Conf Proc IEEE Eng Med Biol Soc. 2006;1:833-6.**Haptic rendering & perception studies for laparoscopic surgery simulation.**McColl R¹, Brown AP, Seligman C, Lim F, Alsaraira A.**Author information****Abstract**

This project concerns the application of haptic feedback to a virtual reality laparoscopic surgery simulator. Haptic attributes such as mass, friction, stiction, elasticity, roughness and viscosity are individually modeled, validated and applied to the existing visual simulation created by researchers at Monash University. Validation studies has shown that refinements to our mechanical interface improves the accuracy of localisation by 25%. Using our mechanical interface, the JND (Just Noticeable Difference) for instantaneous change of magnitude of haptic attributes is approximately 12%. This suggests the mechanical interface is suitable to use for surgery based studies. There are times in surgery when the view from the camera cannot be depended upon. When visual feedback is impeded, haptic feedback must be relied upon more by the surgeon. A realistic simulator should include some sort of visual impedance. Results from a simple tissue holding task suggested the inclusion of haptic feedback in a simulator aids the user when visual feedback is impeded. Haptic force feedback modeling, systems implementation, threshold and level perception, and validation studies form the principal areas of new work associated with this project.

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