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COMPACT COMPLIANCE TACTILE FEEDBACK DEVICE

MECHANICAL, CIVIL, & ENVIRONMENT

Compact, lightweight, and simplistic touch feedback device that provides superior tactile data to operators. For use in various applications, such as robot-assisted minimally invasive surgical procedures.

TECHNOLOGY TYPE

Tactile Feedback
Haptics
Devices

STAGE OF DEVELOPMENT

- Fully-functioning prototype.

- Ongoing research for further miniaturization and integration with other applications.

IP PROTECTION

Portfolio Includes Issued Patents Both in the U.S. and Internationally

US9285878B2
US8326462B1
US8610548B1
US8994665B1

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Reference Numbers: U-4276, U-4415, U-4548, U-4773, U-5660

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TECHNOLOGY SUMMARY

Haptics, the science of interfacing with users via touch, is being used to provide sensory input to users in various applications, including robotic surgery, touch screen displays, and navigational systems. While robotic or automated instruments allow users to manipulate physical objects in a remote or virtual environment, they insufficiently communicate tactile information to users. Users have to rely instead entirely on visual information, decreasing efficacy. Robot-assisted minimally invasive surgery (MIS), in particular, allows for greater precision and control but relies on high-quality visual systems to guide procedures. Surgeons simply cannot feel tactile changes and the impacts of surgical tools within a body cavity.

The Compact Compliance Tactile Feedback Device provides a rendering of surfaces based on the stiffness of the surface in question. The device calibrates based on the user's force and displacement and communicates tactile feedback to the user through pressure or directional motion.

FEATURES AND BENEFITS

- Increases accuracy and efficacy of robot-assisted MIS.
- Reduces likelihood of complications due to inadvertent placement of surgical tools or unidentified surface changes.
- Facilitates almost instantaneous detection of stiffness changes.
- Provides accurate tactile feedback data.
- Small size provides low power consumption and easy integration.

RECENT PUBLICATIONS

Norman S.L., Doxon A.J., Gleeson B.T., & Provancher W.R. (2014). Planar hand motion guidance using fingertip skin-stretch feedback. IEEE Transactions On Haptics. 70:121-30. doi: 10.1109/TOH.2013.2296306

INVENTOR PROFILE

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