Feedback

Tactile augmentation without hindering operation has been achieved.

Acknowledgements

Positional sensing, Physical simulation, Tactile rendering

Concept

We provide a simple tactile Augmented Reality (AR) system which enables users to feel augmented object by using the developed device. In the demonstration, users can interact with the virtual object which is superimposed inside the real material by using an instrument.

Processing

1. Positional sensing of the tool tip by using stereo camera
2. Deform the virtual object based on FEM simulation
3. Feedback the virtual grip force according to the applied force to the virtual object

Demonstration -Interact with a virtual object which is superimposed in a real material-

Purpose of the demonstration

To investigate a potential of a tactile AR system with the developed spatially transparent tactile display. Especially, modulation of the perception during a tool manipulation with a virtual object superimposed to the real material will be evaluated.

How to Interact with a virtual object

Users attach the electrodes on their index finger, and calibrate the amount of current. Users touch the real object with holding an instrument and feel both real and virtual object which is visually augmented on the real material. Users feel the integrated grip force according to the physical interaction with an instrument and perceive the augmented virtual object.

Conclusion and Future Works

- Tactile augmentation without hindering operation has been achieved.
- It became possible to augment virtual grip sensation and present a virtual object to the real material.
- Apply for the tactile navigation in the neurosurgery.

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