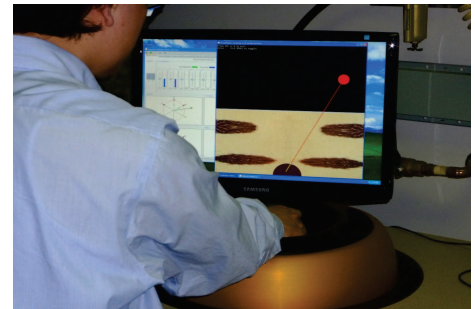
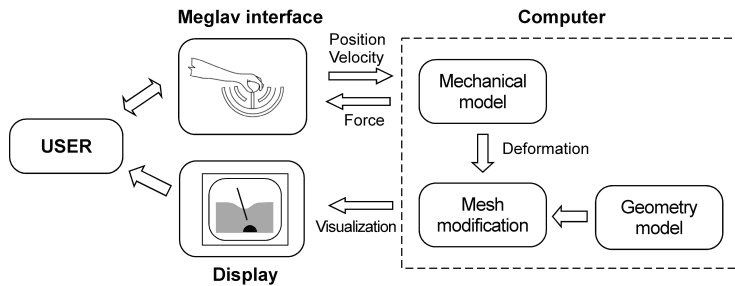


Interactive simulation of needle insertion using a magnetic levitation haptic interface

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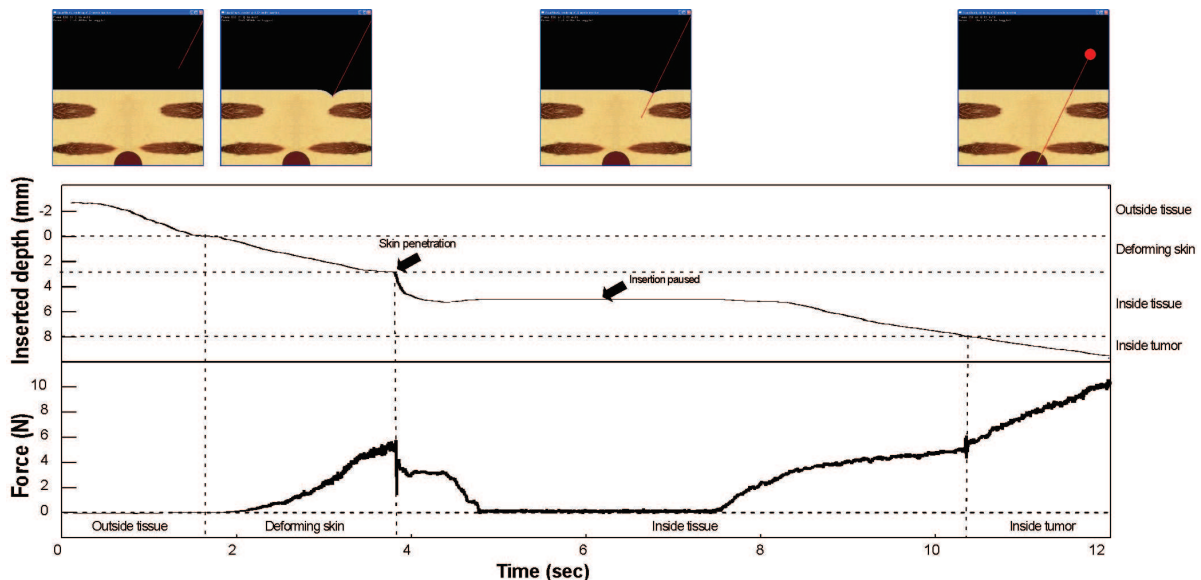
This demonstration presents an interactive simulation of virtual needle insertion into soft tissue. The simulation is developed around a 6-DOF magnetic levitation haptic interface. It provides users haptic feedback of virtual needle insertion at an updating rate of 1 kHz and visual feedback at 60 Hz.



Schematic diagram of the system

Haptic-visual workstation

Haptic and visual feedback during a virtual needle insertion



Ongoing and future work

- FEA modeling of needle bending and insertion.
- Implementation of 5-DOF manipulation and 3D stereo visualization
- Experiments to evaluate the phenomenological validity of the simulation.

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