Haptic Hardware

Omega Series

3 DoF

Omega Series

6 DoF
Omega Series

7 DoF with “positional sensing” or “grasping”

Cyber Touch

• Only feedback is vibration. Fingers + palm.

Cyber Glove II

• 22 “joint” sensors. No feedback, only capture.
Cyber Grasp

• Feedback “resistance” for each finger.


Cyber Force

• 6 DoF “tracking”.
• 3 DoF force Feedback
• 5 finger grasping

“Haptic Workstation”
Magnetic Levitation

http://www.msi.ri.cmu.edu/projects/haptic/video/peter1.mpg

- Single moving part with 6 degrees of freedom
- Zero static friction
- Zero mechanical backlash
- High position and force bandwidths
- High position resolution
- Low perceived mass
- Very wide range of stiffnesses possible
- Mechanical simplicity, no tight tolerances
  - "Kei Usui, a research programmer at CMU, said that it was precise to 2 microns and offered 40 newtons of force."

Immersion: Medical

Laparoscopy, Endoscopy, Endovascular, Arthroscopy, and Vascular Access.

Immersion: Laparoscopy VR

- Real-world medical training.
- Whole unit with VR screen, tracking, and force feedback.
Touch Screens

• Touch Screens are haptics too.
• Multi-Touch screens are the new big thing.

• Video: http://electronics.howstuffworks.com/gadgets/other-gadgets/haptic-technology.htm/printable
• Jeff Han from NYU’s Courant Institute of Math. And Sciences.

Games – Old and New

U. Of Tokyo - Hologram

• Uses “acoustic radiation pressure” to produce feedback.

• Video: http://techblips.dailyradar.com/video/touchable_holography/
Conclusion

• Actual “hardware” making up devices is VERY secretive.

• Can we see why a single SDK would be hard to develop?

• Can we imagine combining these or adding on to any of them to make the “next-gen” piece of hardware?