

Virtual Reality Research

Siena Robotics and Systems Lab

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<http://sirslab.dii.unisi.it>

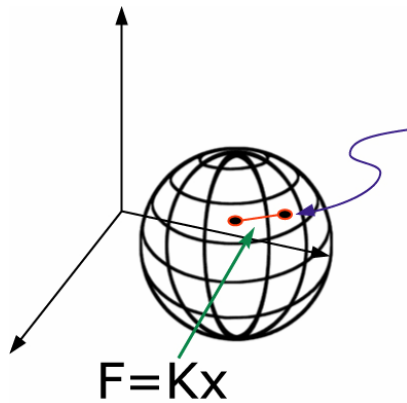
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Haptic Interfaces

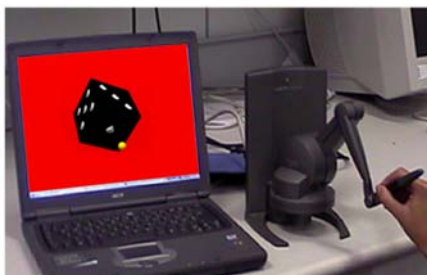
Haptic Interface Principle: Force Feedback

- measure hand positions
- compare with the virtual object (collision detection)
- if there is a virtual contact, apply a force ...



Rigid and deformable objects

Hard Contacts



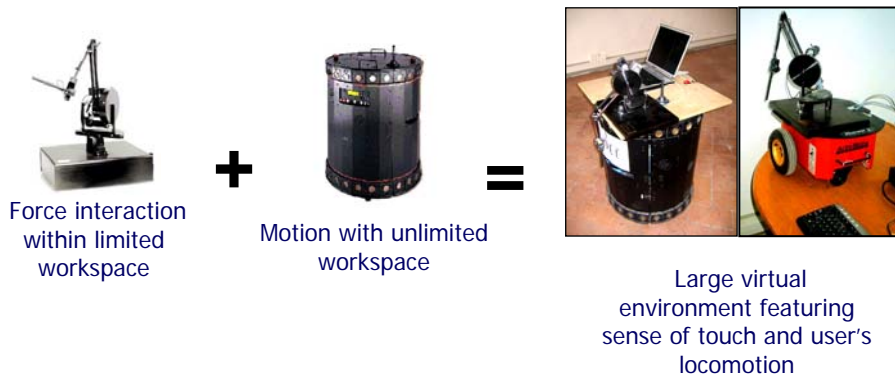
Soft Contacts



- Dynamical interaction with Virtual Environment
- Reaction forces due to the contact with rigid or deformable objects
- Friction force while exploring surfaces

Large Workspace Haptic Interface

Mobile Haptic Interfaces



Motivation:

1. Improved perception (vestibular system)
2. Unpaired persons (training and rehabilitation)

Visual and Haptic Rendering in large environments



Single contact point interaction



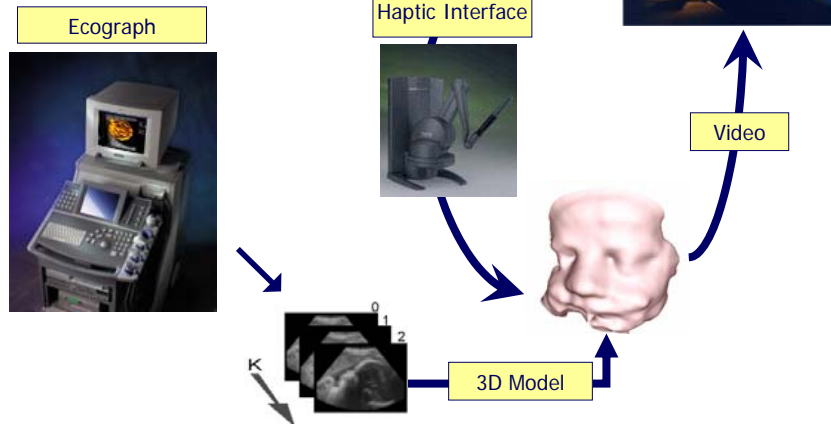
Multiple contact point interaction

[Video](#)

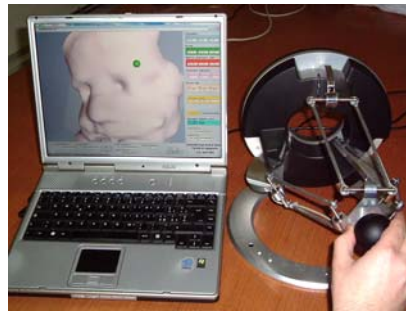
The FeTouch System

The FeTouch System

Touching a virtual model of fetus before birth



The FeTouch System

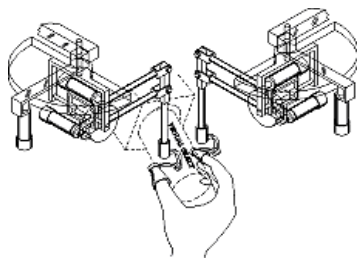


www.fetouch.org

[Video](#)

Multiple contacts and Virtual Grasping

Multiple contact points with rigid bodies



Two-contact-points virtual interaction

Virtual object grasping

Virtual tools manipulation

[Video](#)

- Vedere filmati