

Effects of Force Feedback on VR Task Completion

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Evolution of VR (1950's)



Evolution of VR (2013)



Project Description

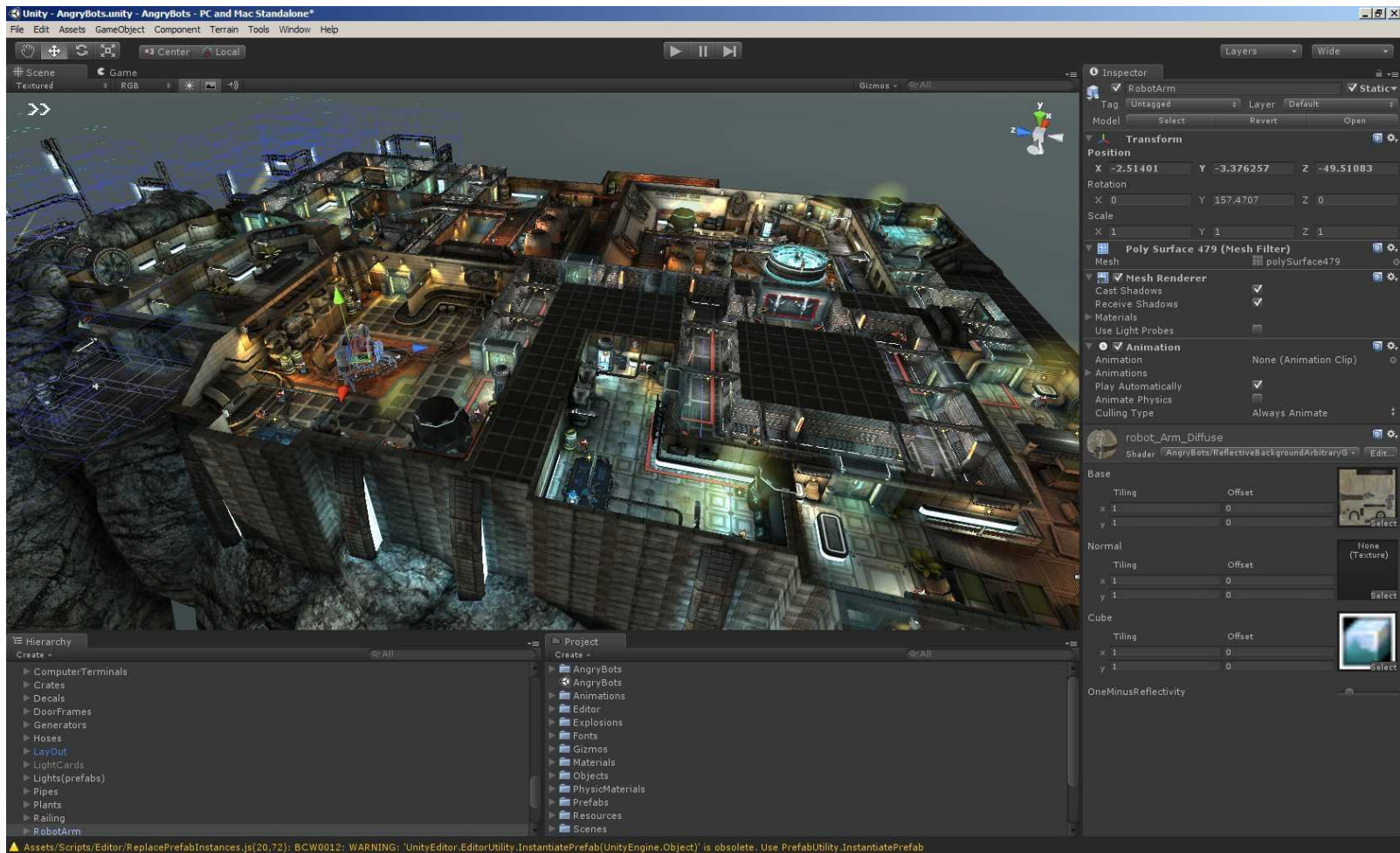
- Design protocol

- Measure human cognitive response/acceptance to virtual world
- Achieve coupling, brain <=> virtual avatar
- Vary modes of presentation
- Look for indications of task learning, etc.

- Build system

- Immersive Virtual World in Unity3D
- Integrate with Phantom 6DOF
- Stereoscopic display

Unity3d



Phantom 6DOF



Procedure

Design Experimental Protocol Around
Phantom 6DOF

Obtain IRB Approval

Haptic Modeling

Recruit Subjects

Phantom + Unity3D

Build Virtual world

Conduct Study & Post-
Analysis

Relevant Studies

- Richard, P., G. Burdea, G. Birebent, D. Gomez, N. Langrana and P. Coiffet, "*Effect of Frame Rate and Force Feedback on Virtual Object Manipulation*"
- G. Burdea, "*Haptic Feedback for Virtual Reality*"
- Fabiani, L., G. Burdea, N. Langrana and D. Gomez, "*Human Performance Using the Rutgers Master II Force Feedback Interface*"

Relevant Studies

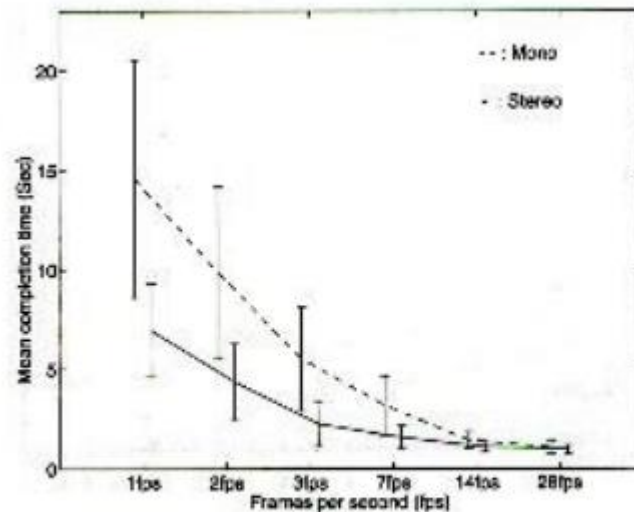


Figure 4. Tracking task mean completion time for different graphics frame rates (monoscopic and stereoscopic displays).

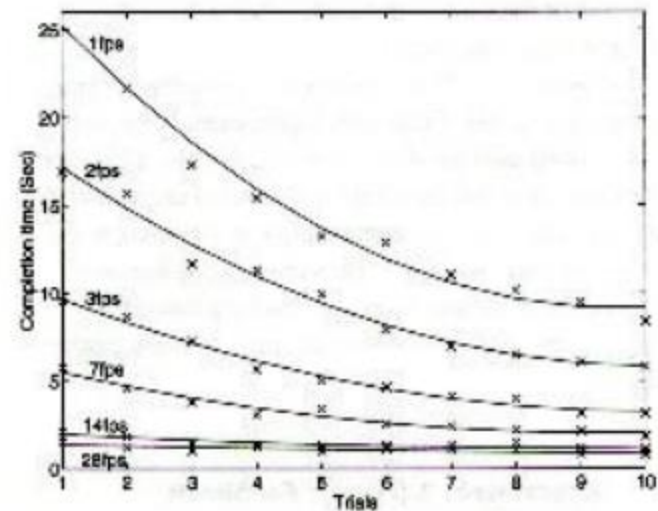


Figure 5. Tracking task learning process for different graphics frame rates (monoscopic display).

References

- Burdea, Grigore, and Philippe Coiffet. *Virtual Reality Technology*. New York: Wiley, 1994. Print.
- <http://ti.rutgers.edu/publications/publications.html>
- www.unity3d.com
- <http://www.geomagic.com/en/products/phantom-premium-6dof/overview>