4/27/16

SFU — SIAT — SCHOOL OF INTERACTIVE ARTS + TECHNOLOGY

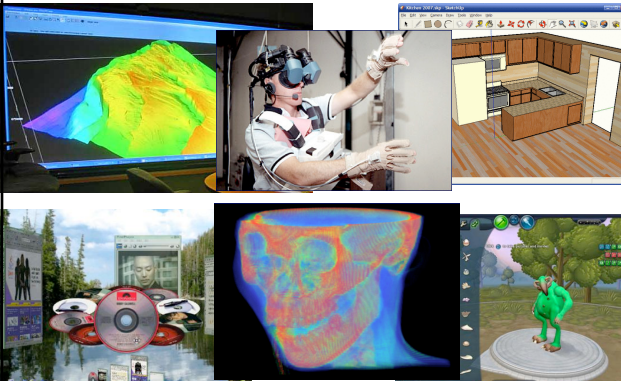# Towards Better User Interfaces for 3D

Wolfgang Stuerzlinger
Simon Fraser University, Vancouver
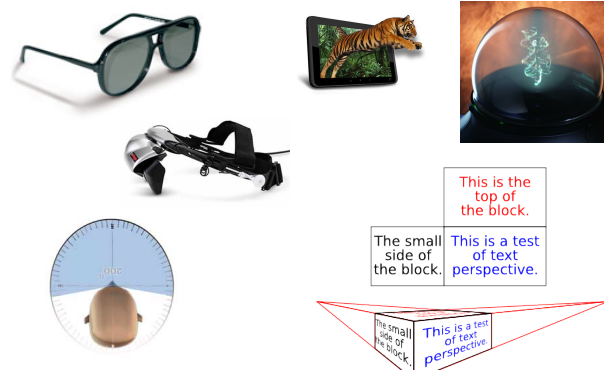ws.iat.sfu.ca

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3D UI in 'Iron Man 2'

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Real Examples for 3D UI's

Output

This is the top of the block.

The small side of the block. | This is a test of text perspective.

The small side of the block. This is a test of text perspective

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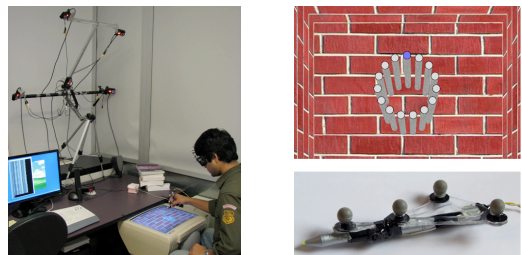
Spatial Navigation/Manipulation

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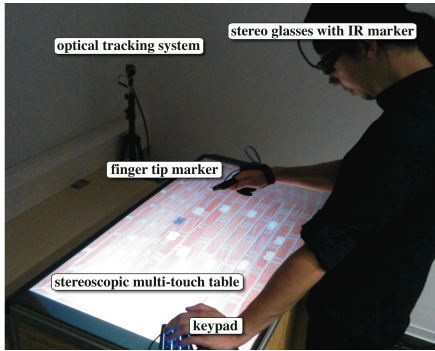# 2D & 3D Input for 3D Pointing

Compare in Fishtank VR system
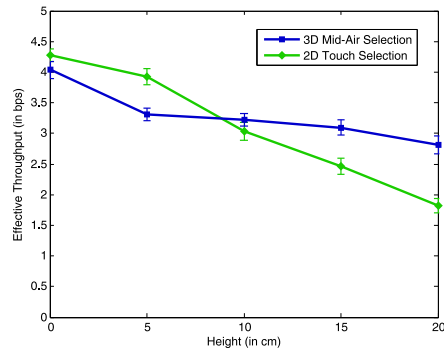- Effective throughput, ISO 9241-9

[Teather PhD]

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2D & 3D Touch

stereo glasses with IR marker
optical tracking system
finger tip marker
stereoscopic multi-touch table
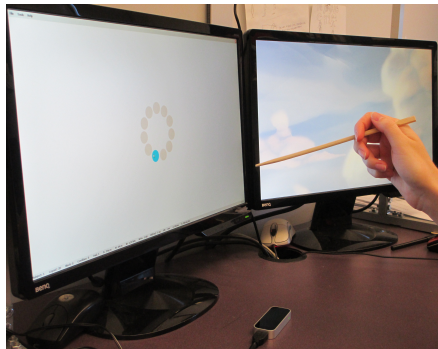keypad

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Results

[G. Bruder, F. Steinicke SUI 2013]

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Chopstick Input

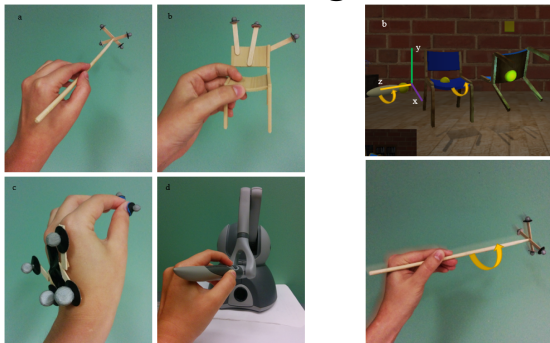[M. Brown HCII 2016]

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Haptic Feedback

Tracking System
Hand Button
3D- Target Projection
Vibration Motor
EMS Electrodes
EMS and Control System
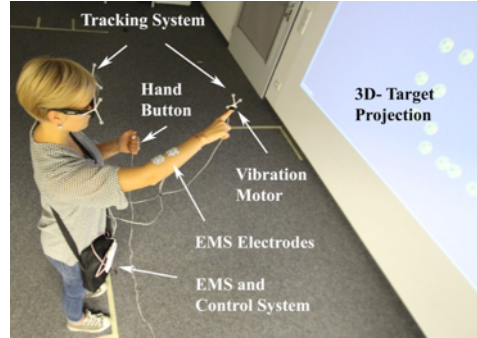
[M. Pfeiffer 3DUI 15]

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Docking

[V. Vuibert, J. Cooperstock SUI 2015]

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New Ideas for 3D UI's (1)

OMG LAG!!

[with C. Wingrave, Dagstuhl08]

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New Ideas for 3D UI's (3)

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Sliding Video

[J.-Y. Oh, GI05]

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(Basic) Sliding technique

Find contact behind area of moving object

1. Draw background (z-buffer)
2. Draw back-faces of moving object
3. Identify min distance
4. Use geometry to position object
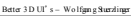5. Collision detection (GPU)
6. If collision, go to 2.

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Puzzle Task Video

Demo

[D. Shuralyov, 3DUI11]

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3D Rotations

[D. Scheurich, Interact13]

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Enhanced Sliding

Object does not float

[J. Sun, D. Shuryalov submitted]

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SHOcam: Enhanced Navigation
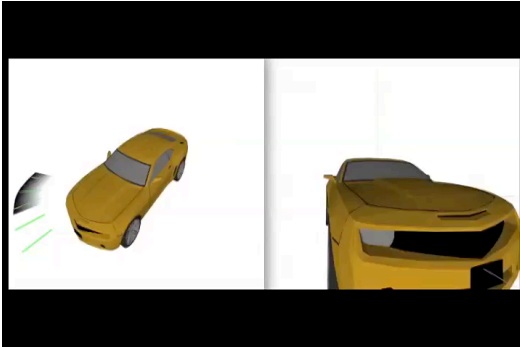
[M. Ortega, D. Scheurich, UIST 15]

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Camera Speed Control

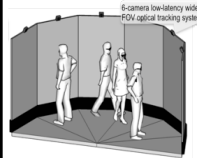[D. Papoi, D. Scheurich, to be submitted]

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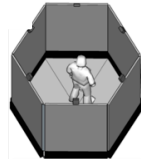
TIVS - 8'x6', 7' high

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V4-Space – 8x85" 4K w. Stereo

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Future 3D User Interfaces

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End

Thanks
- Ji-Young Oh
- Rob Teather
- Dmitri Shuralyov
- Doug Scheurich
- Andriy Pavlovych
- Junwei Sun
- Domi Papoi
- …

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