CSE 165: 3D User Interaction

Lecture #15: Symbolic Input Part 2

Upcoming Deadlines

• Sunday, February 28th at 11:59pm: • Homework project 3 late deadline • Monday, March 1st at 4pm: • Discussion project 4 • Sunday, March 7th at 11:59pm: • Homework project 4 due • Sunday, March 14th at 11:59pm: • Homework project 4 late deadline

Announcement

- Prof. Ramamoorthi will be teaching
 CSE 168: Computer Graphics II: Rendering this spring quarter
 - <u>https://cseweb.ucsd.edu/~viscomp/classes</u> /cse168/sp21/168.html

3D UI Presentations

• Enlil Odisho:

- Interhaptics Haptic Composer
- Xiaoyang Yu:
 - Coretet: A dynamic virtual musical instrument for Twenty-First Century
- Matthew Whiting:
 - Immersive Light Field Video with a Layered Mesh Representation

Soft Keyboard in VR

• State of the art example: Rec Room



Punchkeyboard

- <u>Makes it easier to hit the keys by offsetting</u> <u>hit point from controller</u>
- Simulates drum sticks



Hybrid Keyboards

With tracker: Logitech Bridge SDK
Vive Tracker attached to keyboard
3D model of keyboard in VR



Hybrid Keyboards

- Virtual Keyboard Overlay
 - Part of Infinite Office
 - Partnership between Oculus and Logitech
 - Designed for a specific keyboard (K830)



Pen-Based Keyboards

 Write with "digital ink"
 Optional parsing of handwriting into ASCII text





Virtual Notepad: Handwriting in Immersive VR (Poupyrev 1998)

Gesture-Based Techniques: Sign Language

- American Sign Language Recognition using Kinect Skeleton features
- ASL Tutor -- Leap Motion

 + machine learning to
 recognize sign
 language -- TAMUHack
 2015



Numerical Gestures

Intuitive, no learning curve
One finger raised = 1, etc.



• Potential cultural differences



Speech-Based Techniques

- Single character: words entered by spelling them out
- Whole word recognition
 - Speaker dependent or independent
- Raw storage of speech input (no parsing)
 - e.g., audio annotations
- Al driven speech recognition engines:
 - Microsoft Speech Recognition API
 - Mac OS speech recognition engine
 - Free IBM Watson Unity asset
 - <u>https://assetstore.unity.com/packages/tools/ai/ibm-watson-unity-sdk-108831</u>

Example: Amazon Alexa

