Project Review Session
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COMS 4172
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Past 4172 Projects

Spring 2014
  TowAR, Bomb Defusal

Spring 2013
  brickbreakAR, GroundShotAR, FIAR

Spring 2012
  Tomato Hunter

Spring 2010
  ARmonica (next slide)
ARmonica
A Collaborative Sonic Environment

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UIST 2010

Bars and ball launchers hover over a table covered by an optical marker array
Ball launchers launch virtual balls
Players position/edit virtual bars
Bars play sounds when struck by virtual balls
Balls move under the influence of physics (i.e., gravity)

Goal
Collaborate in creation/editing of 3D audiovisual AR environment

Research challenge
Supporting walk-up usability without sacrificing deeper functionality
Manipulation

Wiimote (virtual hand)
  Tracked with a rigidly affixed optical marker array

Add mode
  Select bar or ball launcher
  Place it at a desired position and orientation
  (optional) Select parameters (e.g., instrument, bar’s pitch)

Edit mode
  Select existing bar or ball launcher
  Change its position or orientation
  Modify parameters
  Delete

Inspired by:

http://balldroppings.com/js/
(works in Chrome)
Client-Server Architecture

Physical simulation performed on a server machine
All connected clients receive updated positions and orientations of physically simulated objects in the scene
Consistent, synchronized scene state
Client renders from its own position and orientation
Trails require separate physics simulation at super-high frame rate to “see the future”

 Hardware & Software

Hardware (2 users)
- 2 × Vuzix video see-through HWD
- 2 × Client PCs
- 2 × Wiimotes
- Main Server PC
- Physics Simulation PC
- 2 large (4’ x 3’) marker arrays, arranged in L-shape

Software
- GoblinXNA
- Lidgren Networking Library
- ALVAR tracking library
- Havok Physics engine
- WiimoteLib (Bluetooth)
Publication


http://dl.acm.org/citation.cfm?id=1866240

Video:
https://youtu.be/IT7ac3zQOIQ

Vuforia/Google Cardboard

With Vuforia 5.5, Cardboard SDK not needed to integrate Cardboard with Vuforia

Augmented Reality mode supported

   Uses Vuforia for tracking and stereo display
   Supports multiple AR devices
   Can transition to VR mode with Transition Manager script

VR Mode does not support Vuforia position tracking by default

   You need to modify the Transition Manager script to integrate Vuforia's position tracking with orientation data supplied by the device
TA Final Project Help Session