Digital Sandbox – User centric urban planning
AGENDA

• The team

• Project – idea and approach

• Some details on implementation

• Related links, Source code

• Small demonstration
The team

- Project done in association with:
  - Gadi Sprukt
  - Helmut Feder
  - part of their master thesis in ‘MA Creative Practice Narrative Environments’
Project – Idea and approach

Gillet Square, London
(image: Helmut Feder)

site of workshop
(image: Helmut Feder)
the Project

• Duration: November 08 – Mid April 09

• Context
  • Redevelopment of Gillett Square (Hackney London) in 2006
  • Unpleasing results, only few people attracted
  • Further development planned in the area
  • Opportunity to present own ideas, support by City of London

• Idea :
  • Find ways to better integrate people in future planning process
  • Aid professionals consulting them
  • Enable them to express their ideas with a playful, easy to understand interface

• Own Part : Technical concept and software–development, aiding with all sorts of technical issues and questions, 3 stays in London in preparation for the workshop
Project – Area in question

- Red marked areas subject to redesign
- Below a mockup image of final size
Project – Design needs and workshop

• Design guidelines
  • Enable people to arrange objects by placing and moving cards on a table
  • Projected view of the square as a background
  • Objects on cards correspond to virtual objects augmenting the screen
  • provide basic user-guidance with 3 ‘Game-Phases’
  • easy to provide with new content and markers

• Workshop
  • 3 day workshop in a cafe situated on the square (stable software !)
  • passengers invited to create individual versions of Gillett Square
  • after filling out a small ration questionnaire rewared with a printed copy of their design
Project – Implementation Overview

- Implementation ideas:
  - computational camera for pose estimation (using AR-Toolkit)
  - 3d Engine supporting basic features (Model-loading, Scenegraph, etc.)
  - tracking done ‘bottom up’ through a fibreglass-table (avoiding occlusions)
  - back projection on a canvas (comparably large and bright screen)
Project – Workshop

- Public workshop in a Cafe on Gillett Square (3 days during april)

- The setup
  
  - Content divided in different ‘game-phases’: People, Street furniture and buildings
  
  - 10 – 15 min on average for creation of scenarios
  
  - participants talked about what they built and why, filled out a questionnaire
  
  - printing out final screenshots, presenting them
Project – Statistics

(image: taken from booklet)
Impressions from Workshop

video can be found on http://cip.ifi.lmu.de/~schmidtfa/sandbox/workshop.mp4
Screenshot during workshop
Implementation Details

- Software written in C++
  - uses self-written 3d-Engine providing all sorts of file-loading, Scenegraph, Physics, Shaders, Positional audio, Octrees ...
  - using only cross platform libs (OpenGL, SDL, bullet Physics, lib3DS, CEGUI,...)
  - build available for OSX 10.5 (matter of time;)

- Adaptions for SandBox
  - added marker-tracking with AR-ToolKit
  - simple User Interface (press any key to proceed to next phase)
  - editable XML-Document containing markers/content mapping
  - ShadowMapping on invisible ground-plane
  - Adjustment view to calibrate camera-angles
  - Node-Labels with custom Fonts
  - 3ds Loading
example : Content XML

<markerSet>
  <marker name="trees1" width=170 centerX=0 centerY=0 >
    <patternFile>
      res/marker/pattern1.patt
    </patternFile>
    <scene>
      res/scenes/island/tree3.3ds
    </scene>
  </marker>
  ...
</markerSet>
still Implementation ...

- heavy use of Standard-Design Patterns (Composite-, Visitor-, MVC, -> usual suspects)
- Scenegraph inspired by OpenSceneGraph
Possible future improvements

- Replace AR-Toolkit with decent Feature-Tracker (based on SIFT, SURF algorithms)
- More different kinds of content (+ Physically convincing interaction with scene)
- Switch to Collada-Scene and Modelformat (easier sharing of content)
- Projection of user interface-elements among the markers on table
Related links, Source Code

- All images and video taken from Project Website!
  - http://sprukt.com/sandbox/
  - TheDigitalSandbox@gmail.com

- Sandbox Booklet (including questionnaires and polaroids)

- Source Code Repository
  - https://svn.cip.ifi.lmu.de/~schmidtfa/svn/Asteroid/trunk

- Client for OsX (including content) ~ 300 Mb
  - http://www.cip.ifi.lmu.de/~schmidtfa/sandbox/client_osx.zip
Small demonstration ahead!

- Thanks for listening!
- Any questions so far?