
iMUTS
Interscopic Multi-touch Surfaces
DFG

iMUTS Project

- Interscopic Multi Touch Surfaces
  - combine stereoscopic visualizations and multi-touch input
- Visualization and Computer Graphics Research Group, University of Münster
- Innovative Retail Laboratory at German Research Center for AI, Saarbrücken
- funded by German Research Foundation (DFG)

IMUTS Project

- Idea
  - Combine both traditional 2D interaction and novel 3D interaction on a touch surface to form a new class of multi-touch systems.
- iMUTS should be:
  - simple to use, immersive,
  - low cost, less user instrumentation.
- Interaction surfaces:
  - Direct (multi-touch) interaction with projected surfaces
  - Sensor-based interaction with mobile devices

Research questions

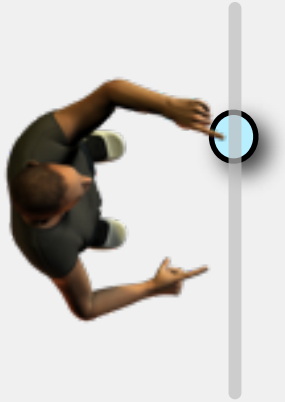
- How to interact with stereoscopic data on a 2D surface?
  - Tabletop/wall-sized projected 3D devices.
  - Multi-touch Interaction on mobile 3D devices!?
- How to get in touch with different parallaxes?
- How could interaction context be incorporated to improve user experience?

Parallax Problem

Parallax Problem

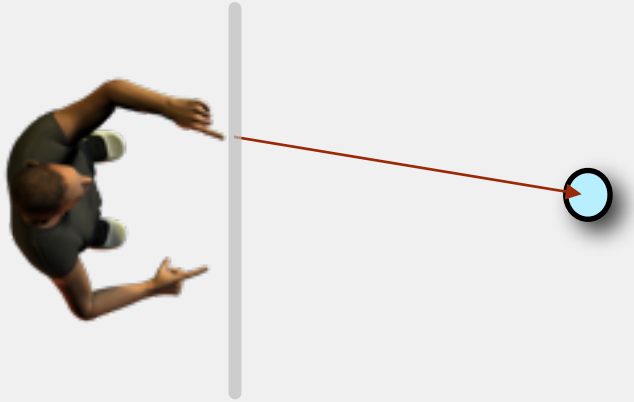
Parallax Problem

- zero parallax
  - perfectly suited for touch interaction



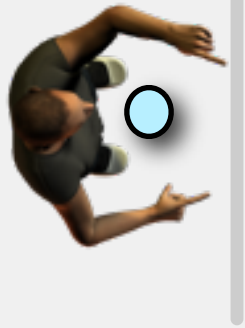
Parallax Problem

- zero parallax
  - perfectly suited for touch interaction
- positive parallax
  - only indirect interaction



Parallax Problem

- zero parallax
  - perfectly suited for touch interaction
- positive parallax
  - only indirect interaction
- negative parallax
  - touch only behind object



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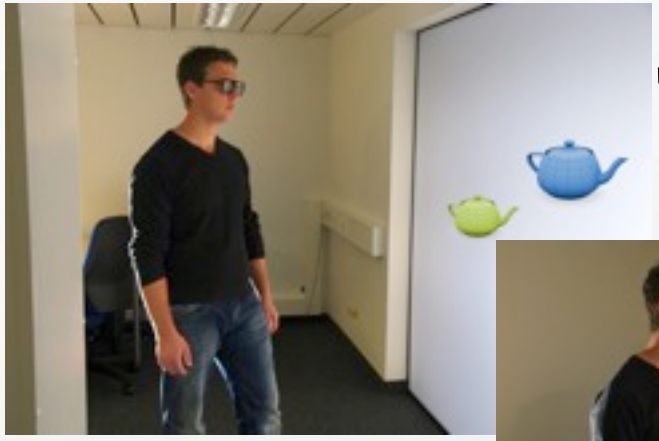
Transitions

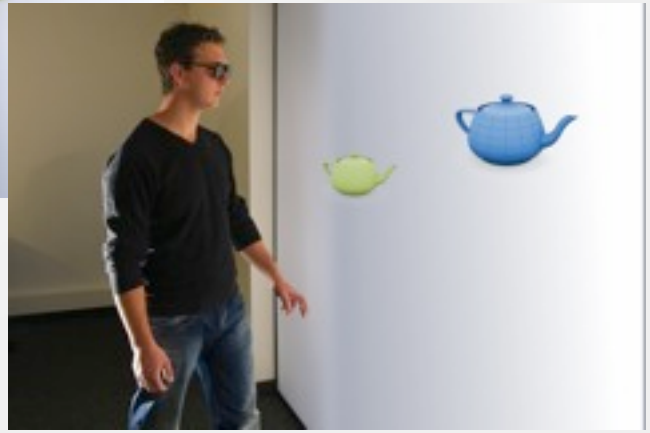
Transitions

observation

Transitions



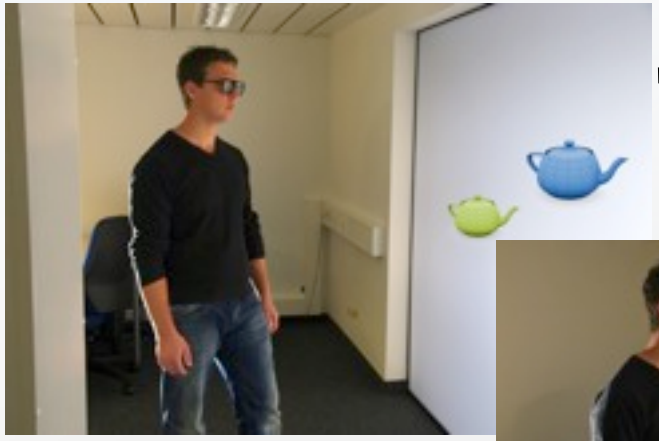
walking



observation

specification

Transitions



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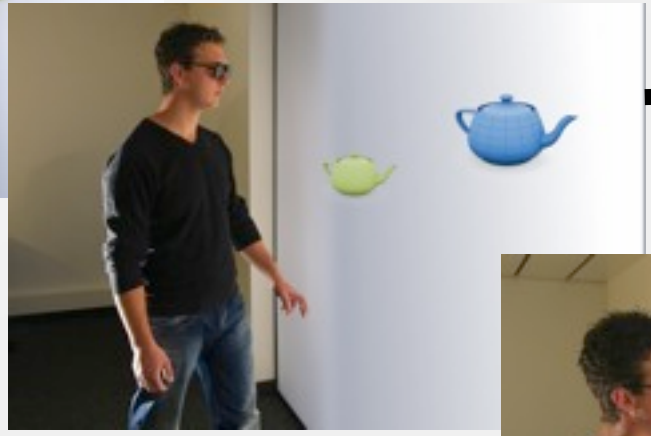


specification

touching

execution

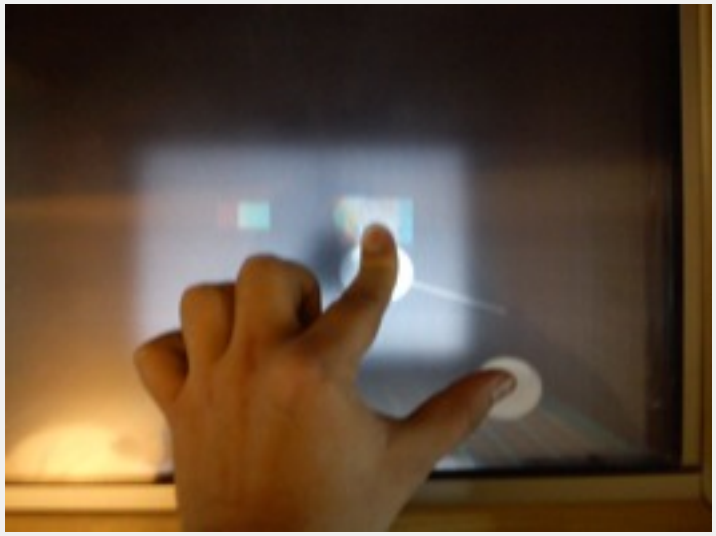
Multi-touch 3D Interaction

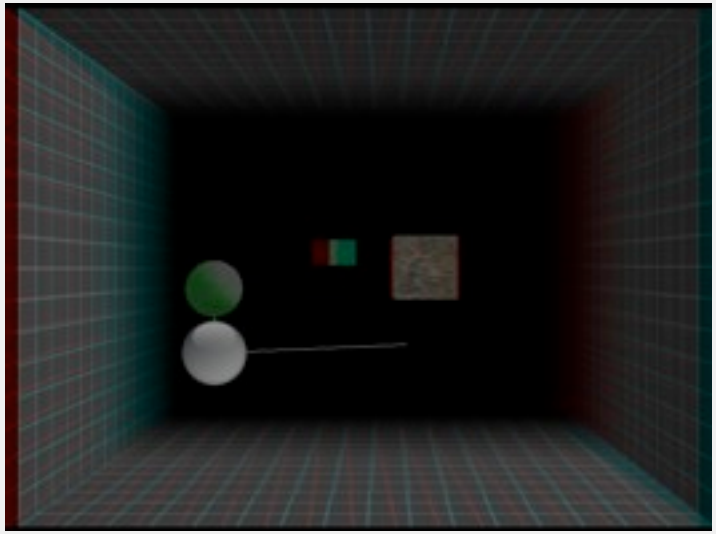
- Multi-touch **selection** techniques for stereoscopic displayed 3D scenes
- Motivation: Balloon Selection

(Benko and Feiner, 2007)

Multi-touch 3D Interaction

- Extending Benko's Balloon Selection
  - Investigating 3D selection techniques,
  - using a 2D multi-touch surface,
  - without further instrumentation,
  - with special focus on different parallax paradims.



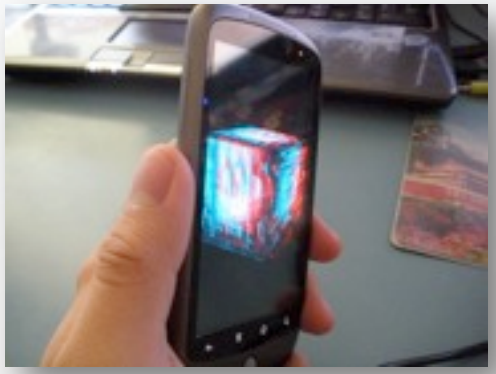
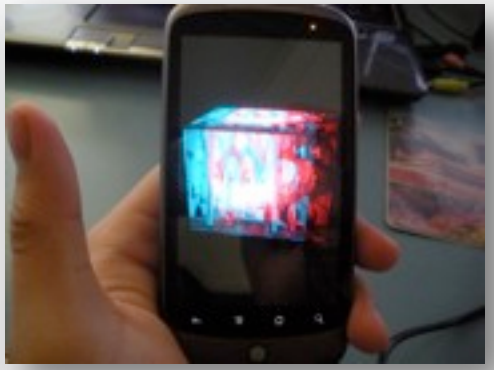
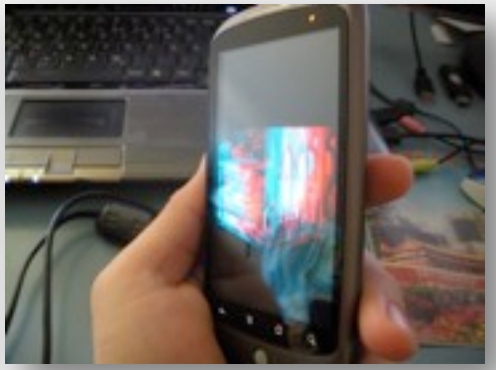


Mobile 3D Interaction

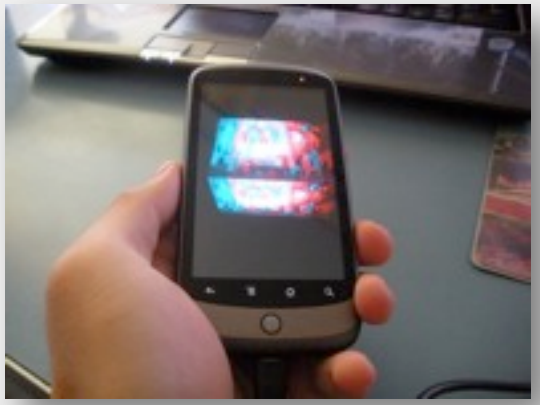
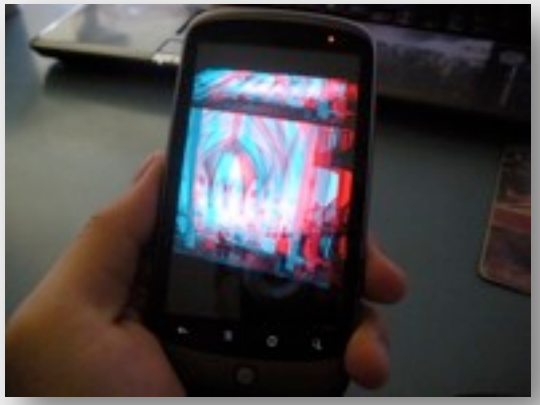
- Interaction with stereoscopic data displayed on mobile devices
- Navigation through and manipulation of 3D objects on mobile devices
- Bi-manual Interaction
  - manipulation of the mobile device
  - manipulation of the objects on the screen

Mobile 3D Interaction Techniques

- Rotation

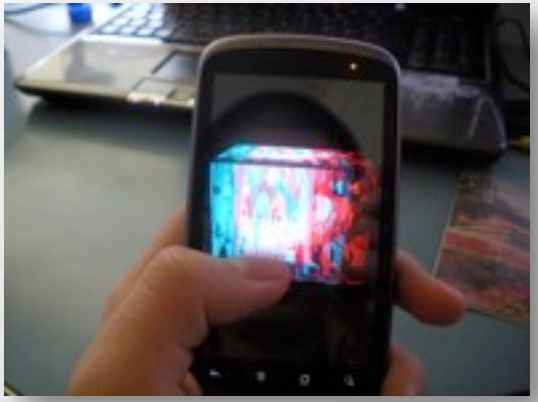




- Shake

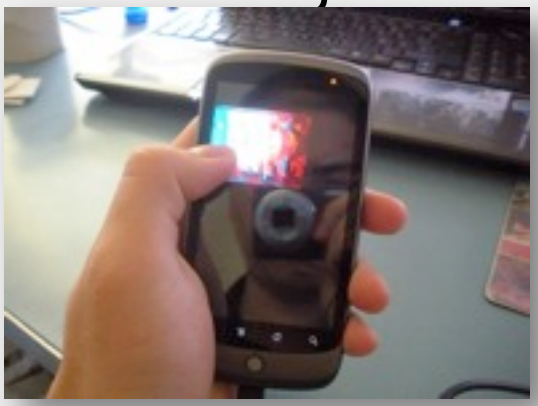
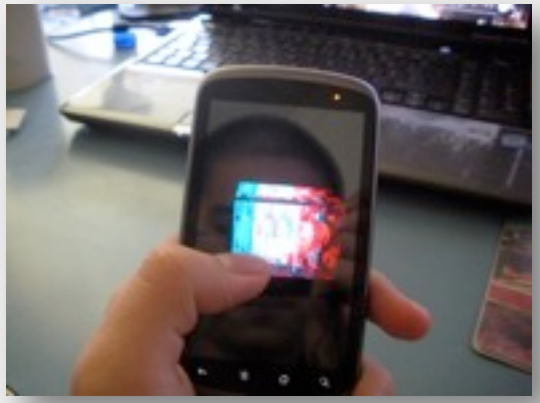



Mobile 3D Interaction Techniques

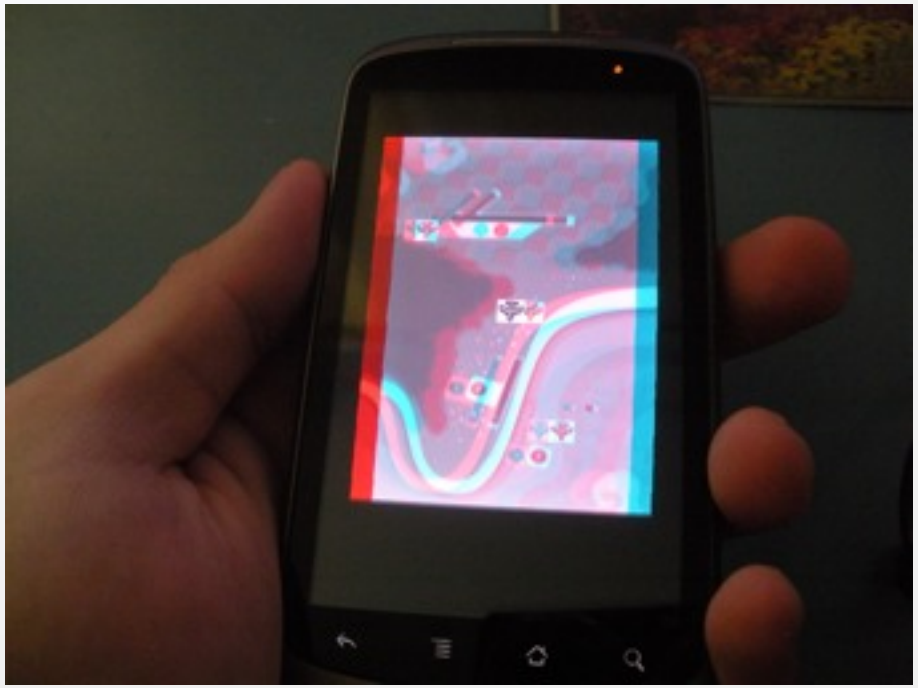
- Touch and rotate

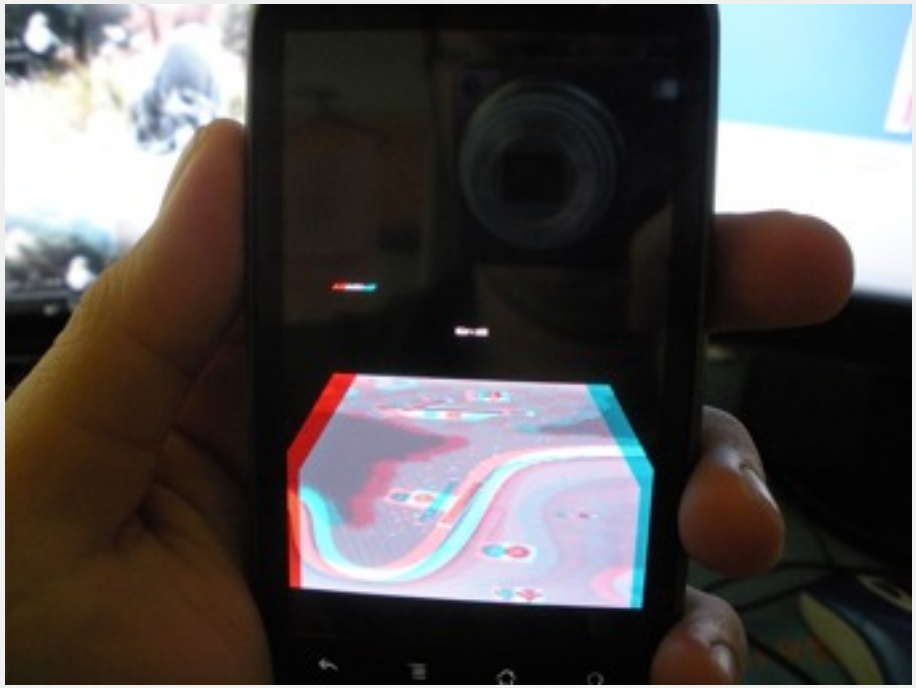



- Touch and drag

Flight Control 3D





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