Interscopic Multi-touch Surfaces
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
Parallax Problem

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

observation
Transitions

walking

observation

specification
Transitions

walking

observation

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