Supporting Volumetric Data Visualization and Analysis by Combining Augmented Reality Visuals with Multi-Touch Input

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Motivations

AR Head-Mounted Display

- No Isolation: Traditional Tools Available
- Concept of Public and Private Spaces
- True Perspective Stereoscopy View Relevant for 3D Visualization
- Large Workspace → Multiple Experts on Multiple Properties

Challenges

General Collaborative Systems

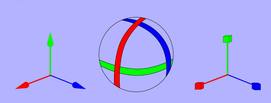
- High Controllability
- Parallel Tasks Via Public/Private Spaces
- Awareness of Other Actions
- Awareness of Deictic Communication
- ⋮

Case of SciVis AR Collaborative Systems

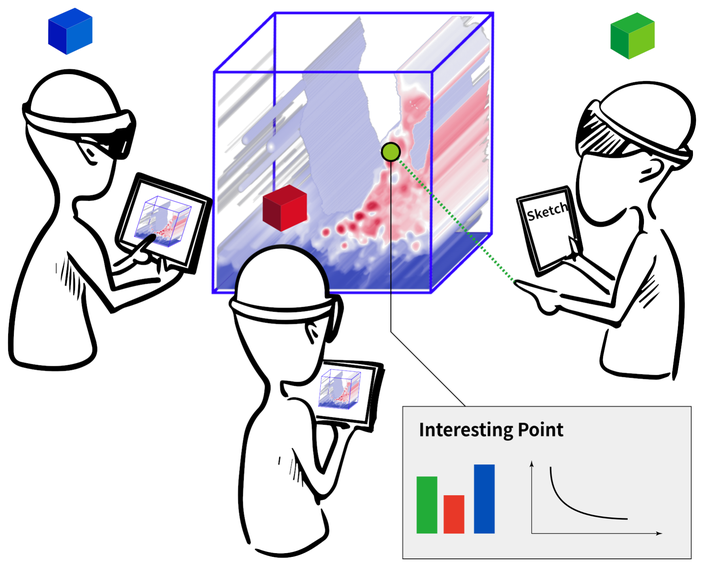
- Parameterize the View
- Same Physical Coordinate System
- 2D Annotations in a 3D Space
- 3D Selections
- ⋮

Vision

Interacting in AR space is difficult: Use another devices for interactions.

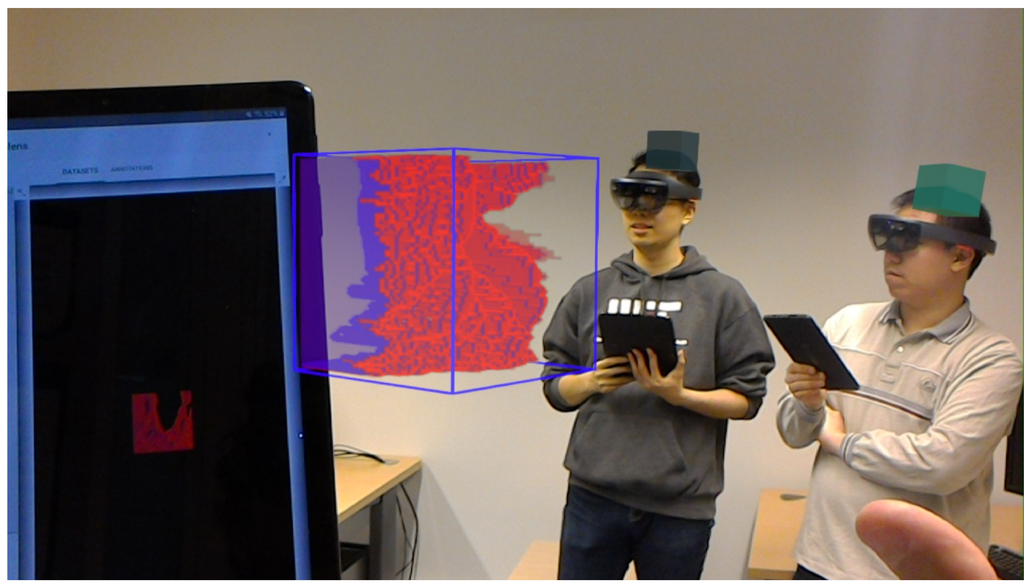
Multi-Touch Tablet →	Open Datasets	3D transformations 
	Annotations	Handling Space States
AR-HMD →	3D Direction / Position Augmentations	Private / Public Space
	True Perspective Stereoscopy	Floating glyphes (awareness)

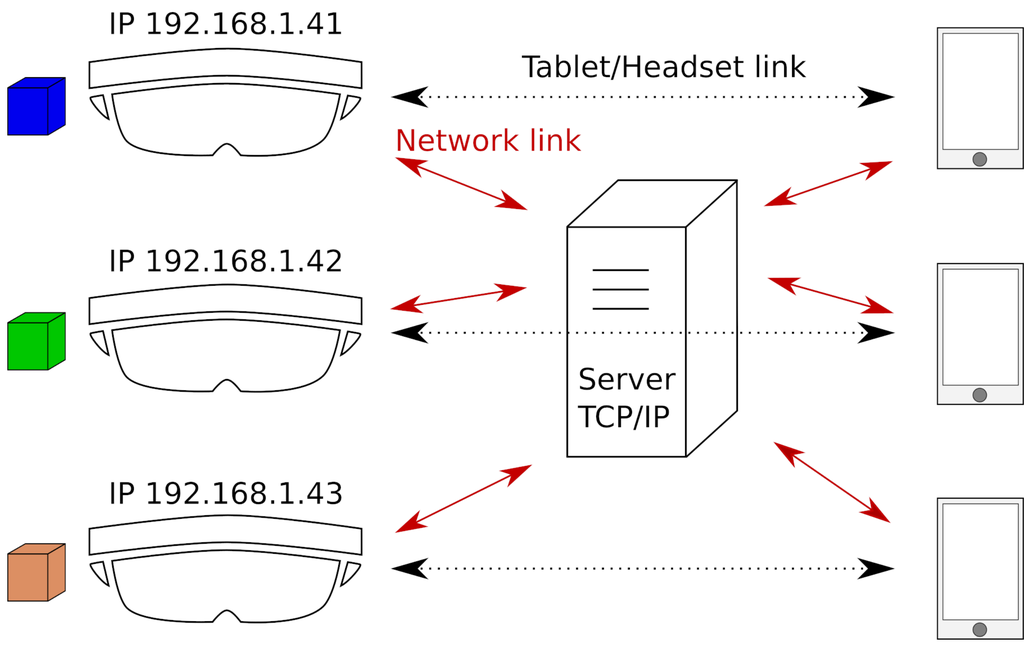
Each multi-touch tablet permits data interactions and sketching annotations. Users are represented by virtual colored cubes floating above them which may encode more personal data. If a user manipulates a dataset on the tablet, the dataset highlights with the encoded color. Pointing cues and 3D position selections are augmented with virtual rays seen by all the users.



Current Implementation

Currently, each user can open, move, rotate and scale datasets using the provided tablets. They are all sharing the same physical space and represented by a small colored cube rendered above their head.





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