

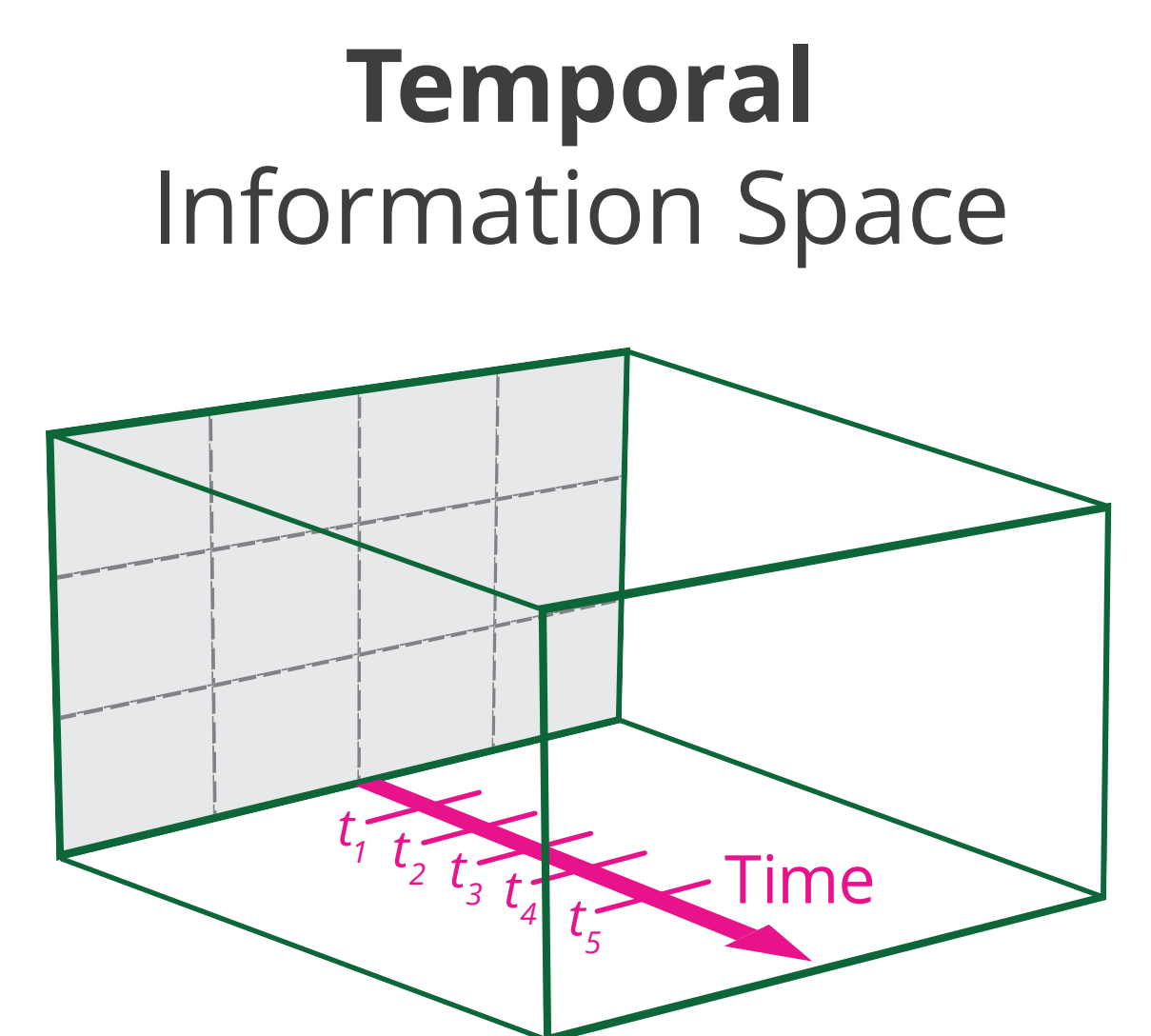
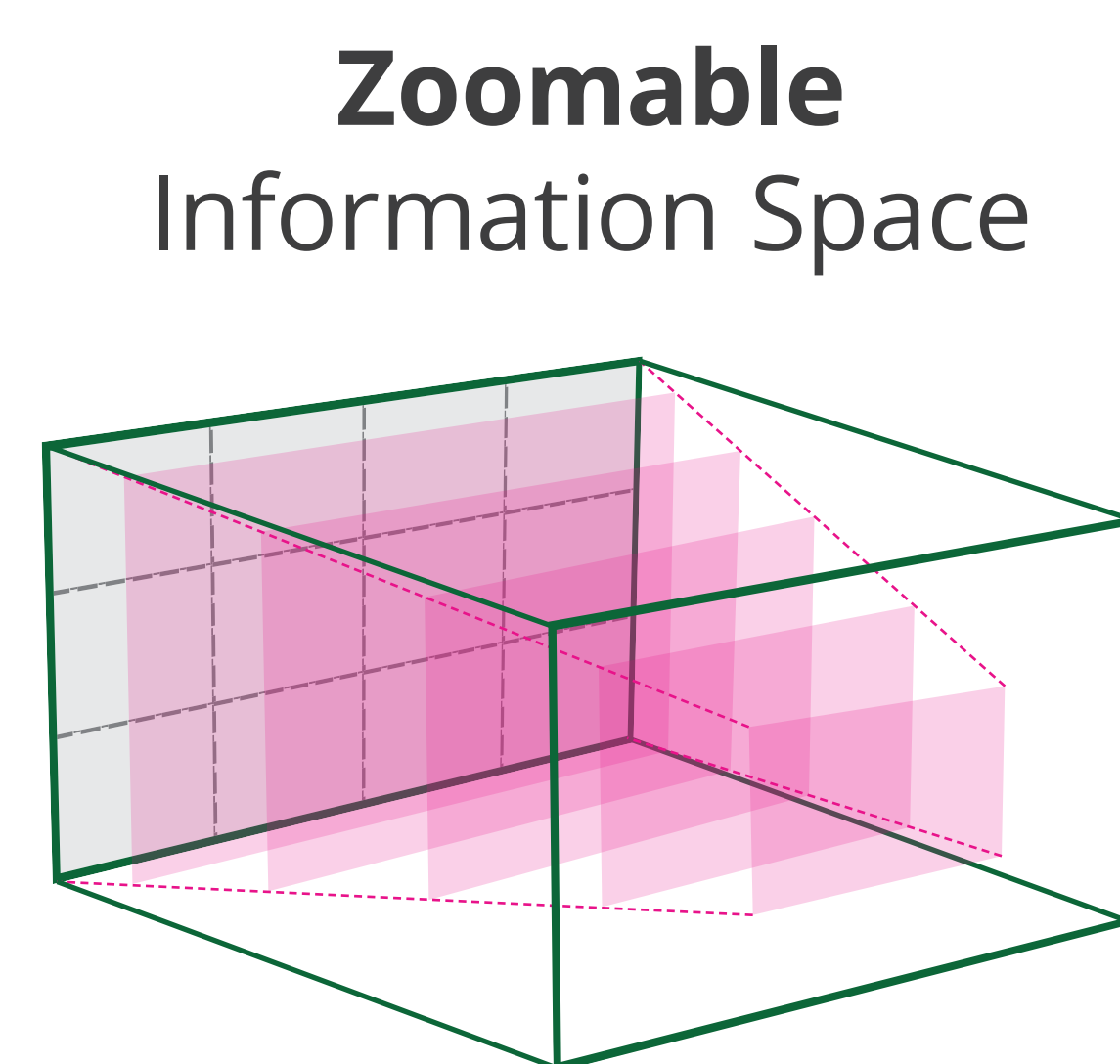
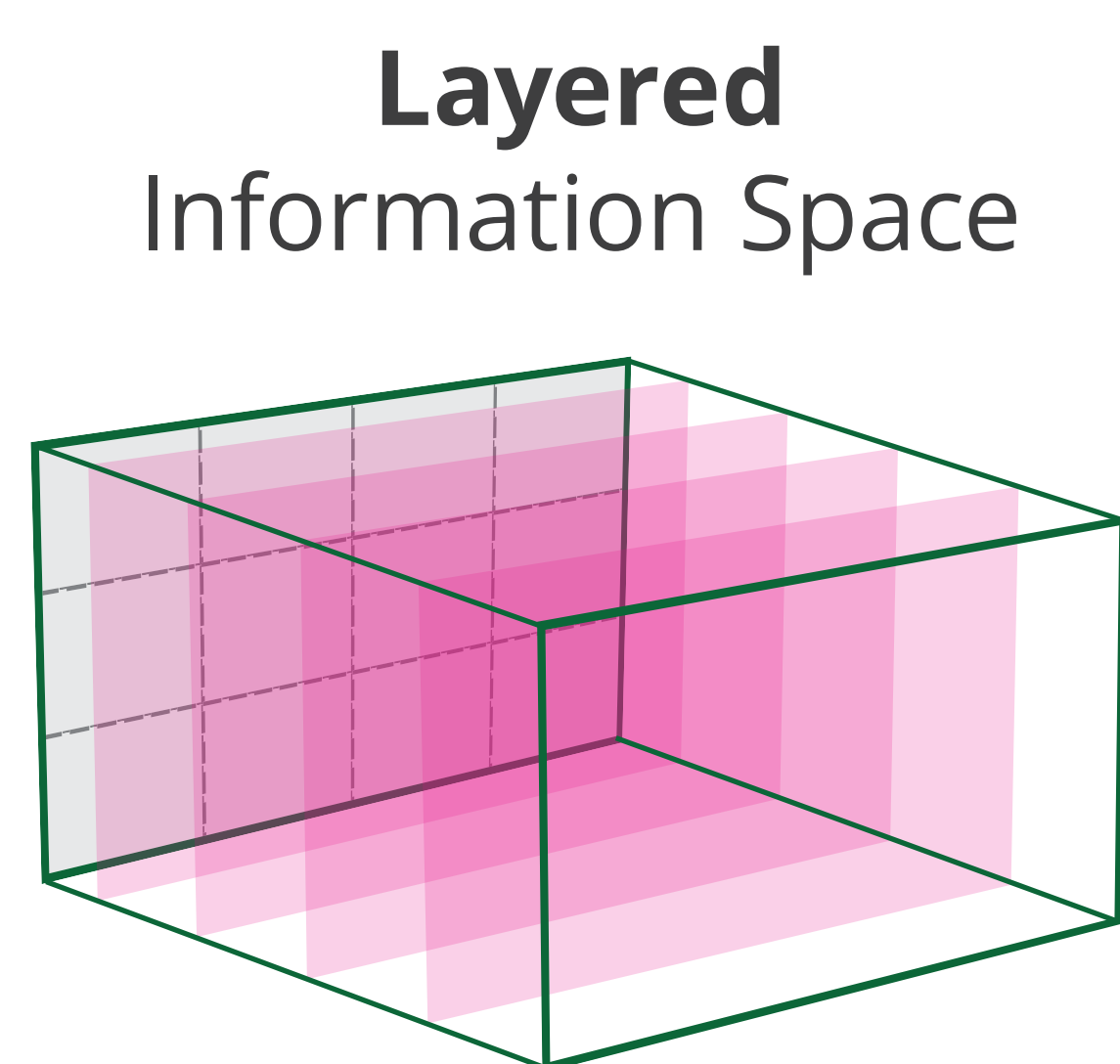
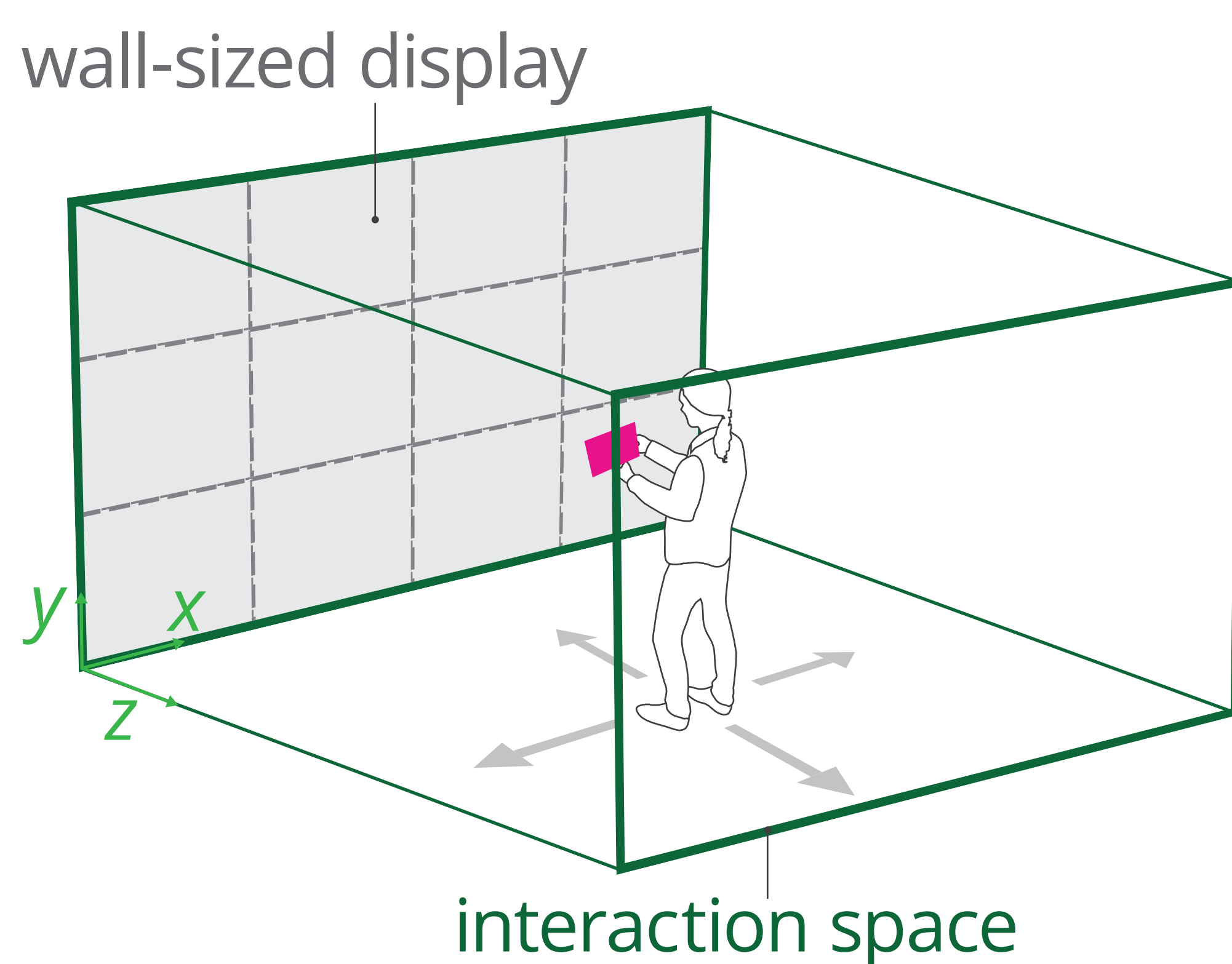
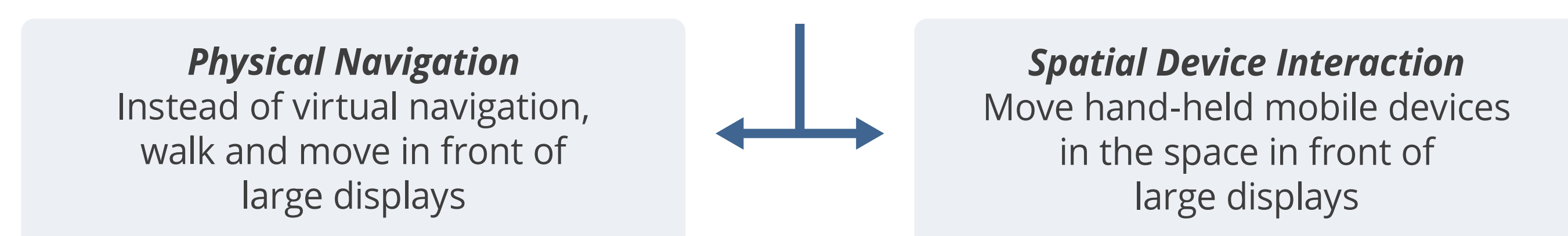
Towards Visual Data Exploration at Wall-Sized Displays by Combining Physical Navigation with Spatially-Aware Devices

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Motivation and Basic Idea

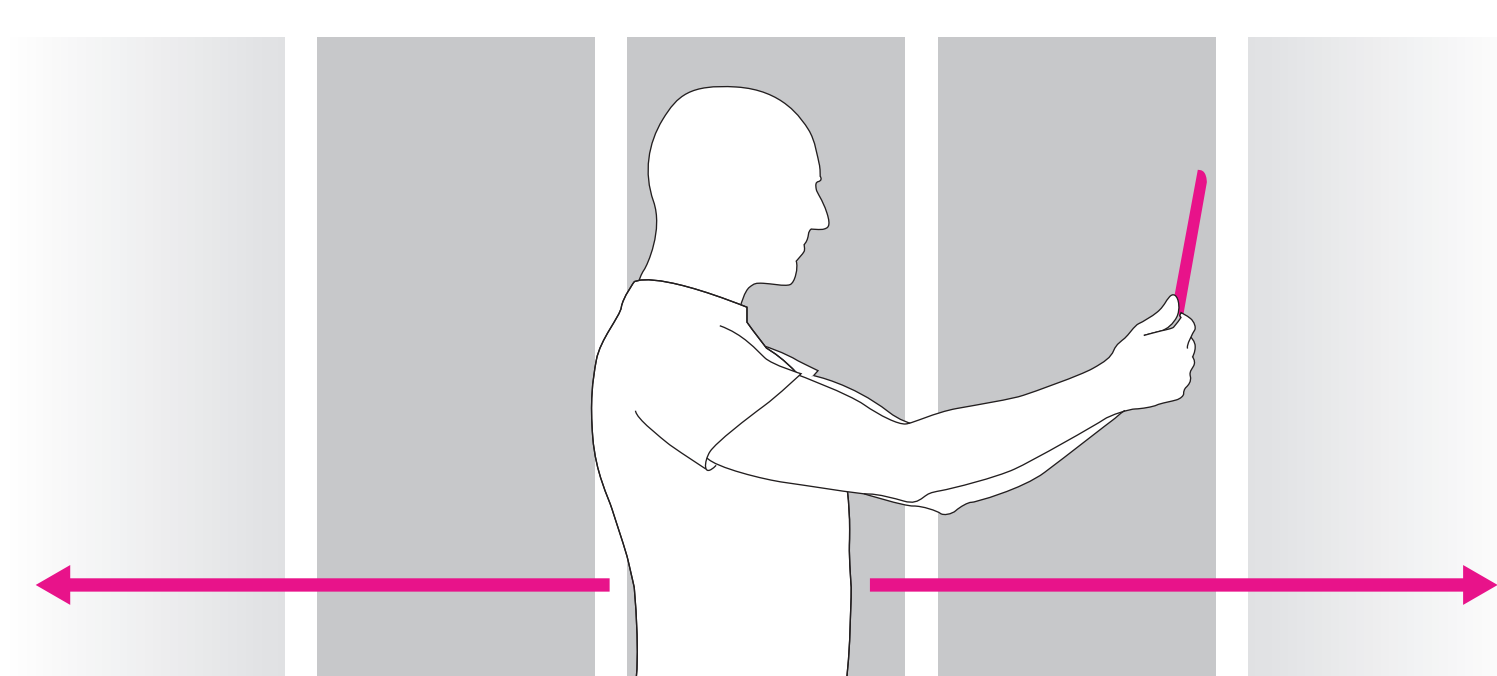
Our general goal: Explore new types of data analysis interfaces and visualization workplaces that take advantage of new input and output technologies.

Combine wall-sized displays with spatially-aware mobile devices

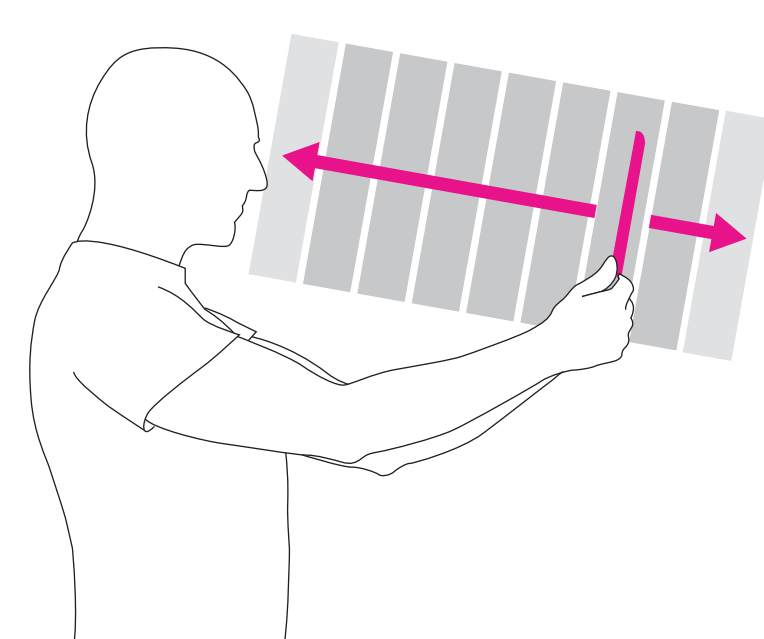


Local Interaction Spaces

The interaction spaces mentioned above use the complete space in front of the large display. As an alternative, spaces can also be placed locally, especially for layered and temporal information spaces. Instead of walking through the space, the hand-held device is moved locally, most likely along an axis between the user's head and the mobile device.



Global Interaction Space



Local Interaction Space

Preliminary Study: Layered Information Space

As a first step towards the use of a global or a local interaction space, we started investigating the selection of target layers of a layered information space by conducting a preliminary study.

Study Setup

- 20 participants (8 female, 12 male)
- Avg. age=26 (M=25.54, SD= 2.72)
- Device: ASUS Nexus 7 (7", 330g)
- 2 conditions: global, local
- 5 sequences of layer selections: 1×25cm, 2×20cm, 2×15cm, 2×10cm, 3×5cm, and 3×2cm
- Session duration: ~20 minutes
- Maximum of 130 selections per participant

First Results

- Easier to complete in *global* space, more failures for *local* space and thin layers
- Less overshooting for the *global* space
- Lower completion times for *local* space
- Participants compensated rough body movements (walking) with subtle arm movements

Prototype: Traffic Visualization

We implemented a prototype application for the visualization of traffic data. We use real-world traffic data of Greater London published by the Department for Transport (UK Government). This data represents a temporal information space, since the data set consists of street-level traffic count for different years (2000–2015).



Overview Pointing a mobile device towards the large display to select a specific map section, which is displayed on the mobile device for further analysis.



Mobile Device

The user interface on the mobile device.
(right side) Allows users to switch between different pointing approaches and to zoom in/out the selected map section.
(left side) Allows to select specific years from the data set.