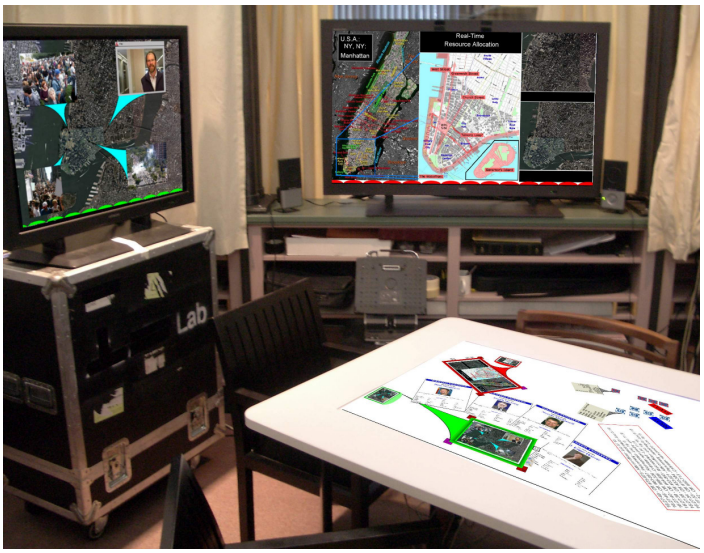
Table Centric Interactive Spaces for Real-Time Collaboration

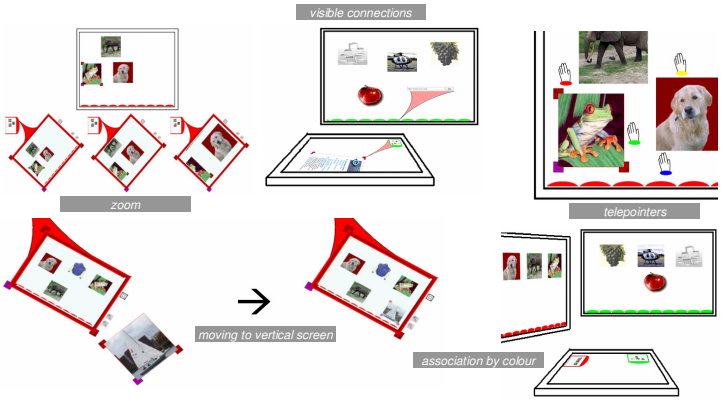
http://DiamondSpace.MERL.com

Motivation

Tables have historically played a key role in many real-time collaborative environments. Today, these environments have been transformed by computational technology into spaces with large vertical displays surrounded by numerous desktop computers. However, despite significant research activity in the area of tabletop computing, very little is known about how to best integrate a digital tabletop into these multi-surface environments. In this paper, we identify the unique characteristics of this problem space and propose a set of designs that demonstrate how an interactive tabletop can be used in a real-time operations center to facilitate collaborative situation-assessment and decision-making. These designs are derived from our observations of two organizations, both of which are actively designing new real-time operation centers. We also report on a study that examined the usability of our designs. The scenario environment shown below is discussed in an upcoming publication, available from our website.

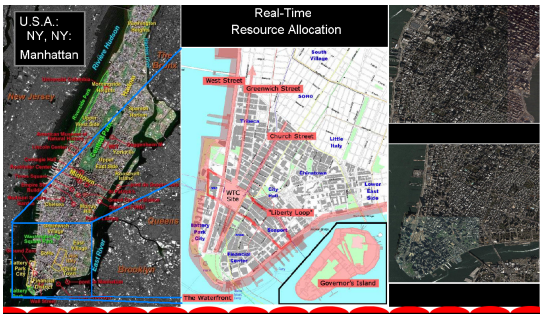
Solutions

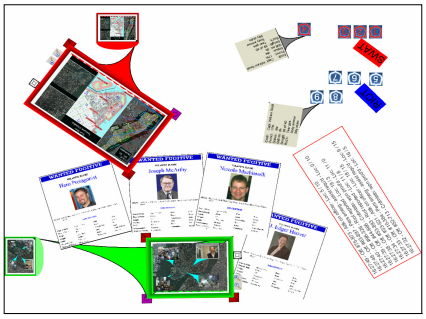




To extend the direct-touch input paradigm of tabletop input to allow complete control of ancillary vertical displays from the table, we implemented a 'World in Miniature' system. Operations on these miniature versions are sent to the ancillary screens, extending the reach of the users to every display in the environment. Adapting the World in Miniature (WIM) technique to this environment required several innovations:

- WIM borders and vertical displays are matched in colour to provide a clear mapping
- WIM's can be rotated and oriented by each user
- Objects can be passed between surfaces by dragging them to and from the WIM
- Zooming the WIM effectively increases the input gain for the vertical display: this can easily and intuitively provide the user with the ability to perform quick and coarse operations with sub-pixel accuracy, without disrupting others' view of the vertical display.





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