Position Statement for Spatial Hypertext Workshop at Hypertext2002

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The hallmark of the spatial hypertext systems has been the flexibility, ambiguity and evolvability of the spatial positioning of objects as a representation. Taking an advantage of this, we use the spatial hypertext representation as a means to interact with linear information being authored. The 2D space is used both to serialize elements (parts) and to provide an overview of the whole (i.e., linear information to be authored). We have developed the interaction model as a framework for the approach, and ART (Amplifying Representational Talkback) design principle has been used to guide the interaction design process for the systems.

The following two points uniquely characterize our position in the spatial hypertext research:
- the semiotic interpretation of spatial hypertext as a representation, and
- the innovative use of spatial hypertext as an instrument to compose information rather than as a medium to represent information.

We use spatial hypertext as a temporary representation to interact-with and think-with, and as a representation to be easily externalized and understood. In our user studies, people use two-dimensional positioning as reminders. While interacting with the 2D space, users do not reflect on the spatial positioning per se; they do reflect on the state of mind that is remembered by looking at a particular aspect of the 2D space. A visual representation reminds the user of a particular situation and thought processes that the user was engaged in when created the representation. The classification of signs that Peirce provides in semiotics, symbolic, iconic, and indexical, has been useful for us to argue for the aspect of two-dimensional positioning serving as indices for thoughts. We view two-dimensional spatial positioning our ART systems provide is a type of indexical interface.

Our approach uses the spatial hypertext representation as a means to interact with linear information. Instead of directly composing linear information, the user interacts with spatially positioned objects to generate a new part and to change the order of the part in the linear information being authored. Beaudouin-Lafon introduces the notion called instrumental interaction. He uses a scrollbar as an example of an instrument for interaction to view the information content larger than a visible

window area. In the ART systems, the use of spatial hypertext is viewed as an instrument rather than as a medium to represent information. Through our experience of implementing four systems that use spatial positioning of objects as an interaction method, we have found that what is really essential about spatial positioning is the feeling of "hands-on-ness." With the graphical interface, clicking, grabbing, dragging, and placing an object on a screen has been found a quite natural interaction method. The use of spatial hypertext as an instrument for interaction can be a promising area to pursue for the next generation hypertext research.

We have presented our approach to use the spatial hypertext representation as a means to interact with linear information being authored. The 2D space is used both to serialize elements (parts) and to provide an overview of the whole (i.e., linear information to be authored). We have developed the interaction model as a framework for the approach, and ART (Amplifying Representational Talkback) design principle has been used to guide the interaction design process for the systems. The use of the spatial hypertext representation as an instrument for interaction rather than a medium to represent information has been found a powerful approach to support cognitively intensive design tasks such as writing.

Because we do not use spatial hypertext as a representation to be produced as a final form of an artifact, our use of the term "spatial hypertext" might be out of the scope if one takes a narrow definition of it. However, we argue that essential aspect of spatial hypertext is in the power of the representation where text objects are positioned in a space through direct manipulation --- the meaning emerges out of collage of the symbolic and the nonsymbolic. Using the spatial hypertext, people elegantly use both visual perception and symbolic cognition. Whether we use spatial hypertext as a final form of an artifact, we must have better understanding of how this works. Understanding how symbolic representations and nonsymbolic visual representations interplay with each other will help us better design spatial hypertext systems; for instance, how we should represent text objects in a space, how we should support users in interacting with the space, and how we should integrate hard structures (such as grouping, lists, and hierarchies) and soft structures (such as spatial arrangement of objects).