

# Rethinking Spatial Object Relationships (Demo)

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## ABSTRACT

A demo will be shown in which interactive spatial word objects have relationships that are ambiguous or even inhibitory, with some discussion of implementation and implications.

## INTRODUCTION

Spatial hypertext has typically involved a number of implicit assumptions. Among these assumptions are: (1) Objects which are spatially associated tend to be contiguous. It is not typical for spatial objects to act on one another “from a distance”. (Note the difference here from node-link hypertext, where there has always been a tendency to assume that a link target may be “far far away”.) (2) Spatially close objects have a relationship which is *cooperative*. We do not expect spatially associated objects to “compete” or even inhibit one another. E.g. a spatial parser [2] is an algorithm which may be present to offer a constructed structure for nearby objects, explicitly on the assumption that if they are nearby they are part of the same structure; the spatial parser offers to figure out for the user which objects should be included and what kind of structure it should be.

In this demo I will show some extremely current artistic work in progress containing interactive word objects where such assumptions do not hold. In this work — which is currently untitled — it is intended that the non-linear will emerge from the linear. The screens being demoed show overlaid polylinear skeins of phrases. (See Figure 1). Each skein “stretches across” space; an individual phrase acts somewhat like a poetic line, and the skein as a whole acts somewhat like a stanza. Skeins may be overlaid with “parallel” or intersecting skeins; in both cases the spatial relationships to other skeins are artistic rather than structural.

Each phrase acts as a “mouseover” hot-spot. When activated, graphical highlighting reveals the next and previous phrase (if they exist) in the skein. While each phrase exists as an object, there is no object for the skein as a whole. Phrases may be overlaid with phrases from other skeins due to various effects. Some skeins intersect. In other cases two skeins may be laid out in parallel (but going in opposite directions). This work contains examples of interactive word objects whose relationship is profoundly ambiguous. The ability to embed ambiguous “protostructure” is of course one of the great strengths of spatial hypertext. On the other hand, there has been a tendency in spatial hypertext to assume that spatially adjacent objects were either part of the same structure, or part of no structure at all. To have spatially overlaid objects as part of different structures poses some

interesting challenges for user interface design — particularly where there is no overall structure mediating them.

## DISCUSSION

The relationship of phrases within a single skein is strictly linear. The requirements for the user interface were that the linear structure be navigable — in either direction. Where phrases from an intersecting skein are located graphically between adjacent phrases in an “open” skein, their mouseover hotspot activity must be disabled while the open skein is navigated.

The solution to this problem was to create on the fly invisible mouseover hotspots which act to *inhibit* underlying phrases from a different skein. When the bounds of the rectangular area “controlling” a phrase are entered, a hotspot is created for the union of a rectangle containing the phrase and its next phrase in the skein (if this exists) and likewise for the previous phrase. The inhibitory effect of these “blocker” hotspots is achieved by simply bringing them to the front, where they “soak up” mouse events. (The work is implemented in Squeak [1], where “the front” is an off-the-shelf facility of the user interface paradigm Morphic. See [3] for a more detailed discussion.) When the mouse leaves the bounds of the phrase’s controller, these blockers are deleted. One drawback to this approach is that it introduces a potential source of bugs: if a mouse-leave event is somehow missed, the blockers may not be deleted, causing wrong behavior by the interface.

Another intriguing problem where nearby spatial objects have a relationship that is ambiguous — or even competing — is *fairness*. How does the user interface insure that there is no bias in favor of one object over another? There are several aspects of the coding behind the objects in Figure 1 which have to deal with this issue. When the mouse leaves a phrase, all phrases in its skein are sent to “the back”. This allows a nearby phrase to be accessed. This works satisfactorily where two phrases are overlaid “in parallel”, but it is not clear if this will suffice where many skeins are overlaid. A more tricky problem turned out to be the size of the hotspot controlling a phrase. Initially this is determined as a fixed offset from the graphical size of the phrase. The problem is that if a phrase at the end of a skein has been sent to the back, it may be larger than its “peer” and thus still block access. Specific coding was needed to allow aligning the sizes of the phrase controllers so that peers had identical bounds. It is not clear if this is a satisfactory solution. The behavior seems correct, but it does violate the spirit of the project that word objects should be independent

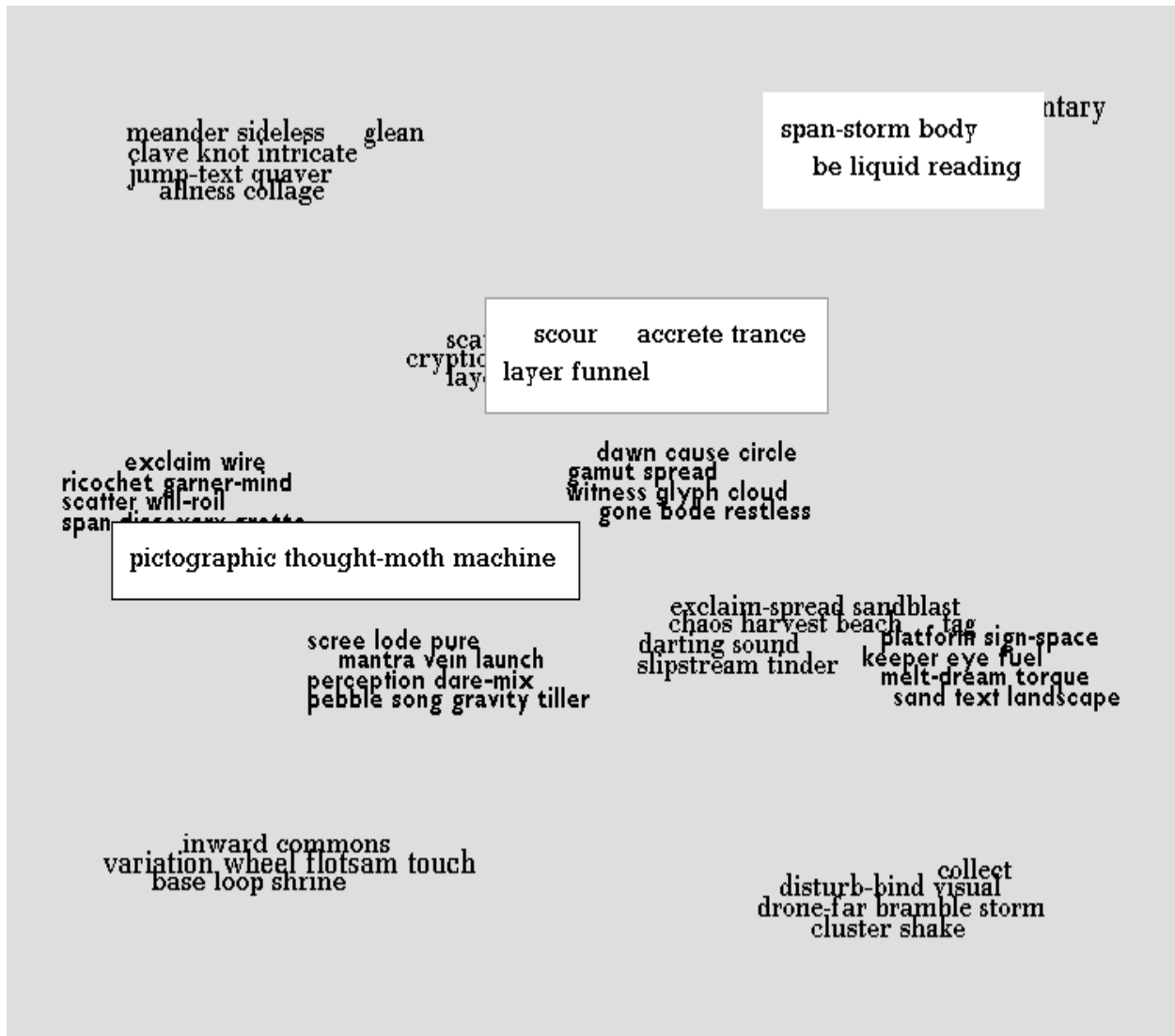


Figure 1

Three phrases from a skein have been highlighted by entry of the mouse in the middle phrase. Directionality in the skein is indicated by color of the phrase border: black goes forward, white goes backward, gray is the current phrase.. Mouse activity of phrases within rectangles forming the union of the current phrase and next or previous phrase is inhibited by creation of invisible “blocker” hotspots.

of one another.

## CONCLUSION

Nearby spatial objects may belong to unrelated or even competing structures, whose colocation serves artistic or other purposes; elements of a single spatial structure may be widely separated in space. Implications of such spatial object relationship variety have yet to be understood.

## REFERENCES

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