If computers are tools for manipulating information, they have been notoriously poor at using the hands of the people who use them. By engaging the hands of the user, it is possible to get a literal handle on complex visualizations of information. In this project, the goal is to design a more practical, productive, and fluid kind of interface.

A Mathematical Twist

This project was inspired by a model of a hyperbolic paraboloid in the Collection of Historical Scientific Instruments at Harvard University. Built of brass and wood, with strings held taut by lead weights, it allowed students to create and examine a variety of hyperbolic paraboloids. We built a scale model with potentiometers mounted at key mechanical points. The change in resistance at those points is used to determine the state of the model as users modify it in real time. On the computer display, a synthetic model is shown, along with dynamic equations that show how variables such as volume and surface area change in tandem with the model.

The goal is to match the real and virtual model smoothly so that users feel as if they are the same object. Future work on this project will include using better graphic representations of the underlying math in the virtual space, which should clarify the connection between the form and the equation.
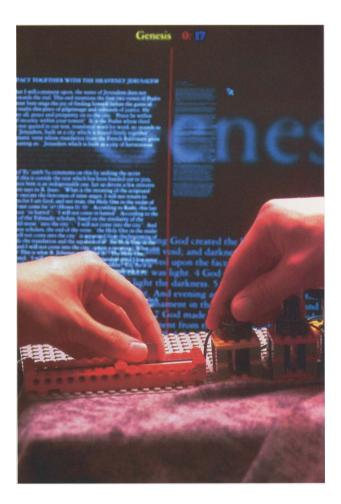
Talmudic Typography

This project was built around an essay by the philosopher Emmanuel Levinas, whose commentary on a tract of the Talmud, which itself is a complex, nested series of references to the Torah, forms an intricate web of text and connections. A visual representation of these interconnected texts should construct a space for discussion and argument in which scholars can pull and push the words as they dissect the intellectual issues posed by the text.

The Talmud is traditionally read by two people, so that it can be argued and debated. The controls were designed to facilitate this style of polemic. While discussing some fine point of logic, either reader can grab a control and modify the visual relationships between the texts in order to support an argument.

Conclusion

If you hold a hammer in your hand, everything in the world begins to resemble a nail. Likewise, we tend to get stuck in the conventional mouse-windows paradigm. By designing new interfaces, we can bridge the gap between the space people inhabit in front of the computer and the abstract landscapes inside the computer.

David Small
MIT Media Lab, E15-443
20 Ames Street
Cambridge, Massachusetts 02139 USA
dsmall@media.mit.edu