

Dynamic3: Interactive Physics and Physicality In Three Dimensions

We lose the joy of pliability in our interactions with the computer when we get lost in a cacophony of visual iconic references. There is no grace. *Dynamic3* emphasizes the subtleties of interaction. Not what is seen, but what is felt. A physics-based computational model and a fluid physical interface amplify the expression.

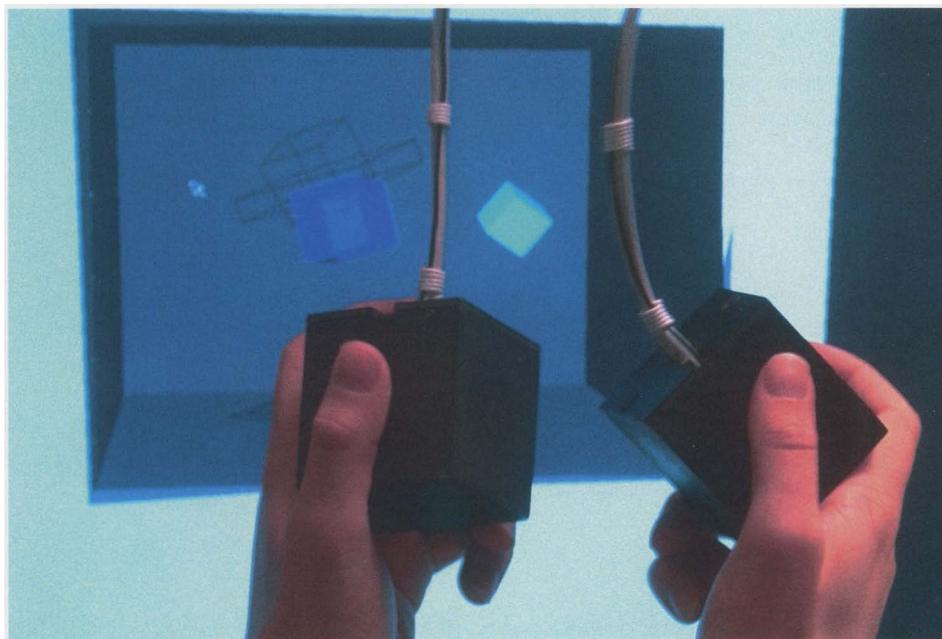
Two physical cubes control a malleable, hierarchical data structure represented as abstract objects on a virtual stage. The external appearance of the physical cubes mimics the simple geometrical forms on the screen. By using interactive particle physics, virtual objects react in ways that correspond to our existing assumptions about our physical world.

The two physical cubes control the position and orientation of their virtual counterparts. A change in position of one of the physical cubes exerts a force on the parameterized particle physics model. By variably weighting various data objects, a new paradigm is introduced, by which the dynamic/motive reaction of information structures gives subtle cues as to the contents of the object.

Through repeated exploration, users are able to feel differences in reactivity and modulate their decisions accordingly, without sacrificing aesthetic or metaphorical continuity.

A firm gesture towards the rear of the virtual stage allows the user to view more detailed information about the contents of the abstract data objects. The camera tracks and pans to a position behind the translucent rear stage. From this position, it acts much like an X-ray machine, revealing the information structure within each data object. The objects' shadows transform into projections of their corresponding data.

Today's supercomputers and tomorrow's desktop machines have tremendous capabilities for display of three-dimensional information in real time. A great deal of work has been done in realistic creation and display of bodies of information, yet navigation and manipulation of these spaces remains frustratingly rigid. Using advanced visualization techniques and traditional design principles, this project creates visceral, intuitive methods for modulation of 3D space for both commercial and design purposes. The physical underpinnings of the interface architecture allow for the possibility of functionally and aesthetically graceful interactions.



Reed Kram, John Maeda
MIT Media Lab
20 Ames Street
Cambridge, Massachusetts 02139 USA
kram@media.mit.edu