**Tangible Bits: Towards Seamless Interfaces between People, Bits and Atoms.**

I'm particularly interested in the "Discussion: Optical Metaphors" discussion section. Combining the principles of physics related to light and real-world spatial relationships can greatly enhance interface readability. However, it's noticeable that the optical phenomena and their applications mentioned are relatively straightforward due to technological limitations. In reality, we encounter a variety of light sources, often acting simultaneously on the same object. The human-computer interaction systems demonstrated at Apple's VisionPro products this year have become increasingly sophisticated. (Unfortunately, my understanding of HCI is limited at the moment, so I can't explain this phenomenon well.)

I think the discussion about multi-interface interactions is a little superficial. The article primarily focuses on the analysis of individual slide objects and provides only a basic treatment for scenarios involving two slide objects. In real-life human-computer interaction, dealing with multiple interfaces is inevitable.

Last but not least, I'm amazed at how the article extracts and applies favorable aspects from previous research in various different fields to benefit this study.

Direct Manipulation: A Step Beyond Programming Languages

I noticed that the article analyzes the selection of images and graphics in Direct Manipulation. For example, from a music software perspective, the use of different music software, song switching, and lyrics mode are all very simple symbols. When I use Chinese music software, the button for lyrics is represented by the Chinese character "词," while in English music software like Spotify, it's obviously not possible to insert a button labeled "lyrics" on a mobile screen-sized interface. However, when I first started using it, the button shaped like a microphone icon immediately conveyed its meaning to me.

I also appreciate the psychological analysis of direct manipulation in this article. I believe that in human-computer interaction, the subject is the human, and the psychological activities of the human in the process of perceiving objects, reacting to them, and transmitting this to the computer in some way should not be ignored. The concreteness of objects can help users quickly understand their programs.

Furthermore, this article has broadened my horizons. I realize that direct manipulation is widely applicable in everyday life, not limited to tasks like driving or screen editing. It can also replace traditional question-and-answer-based computer-assisted teaching. The examples mentioned in the article are ones I've encountered in reality but never realized that this was indeed direct manipulation.