

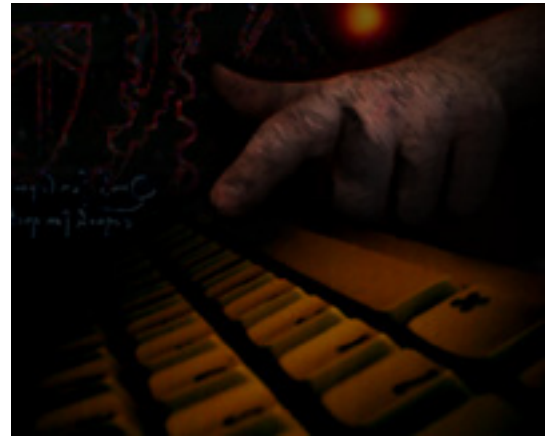


Introduction

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by [Sofia C. DeFernandez](#)

The hope is that, in not too many years, human brains and computing machines will be coupled together very tightly and that the resulting partnership will think as no human brain has ever thought and process data in a way not approached by the information-handling machines we know today. J.C.R. Licklider, 1960 outline of "Man-Computer Symbiosis"



When we are born, we learn to interact with our bodies. Later, we discover the world around us. While understanding this new environment, we learn to interact with other human beings. This never-ending process of interaction is enhanced by the tools we use to communicate and perform tasks. As we come to the beginning of a new century, it is clear that we need to improve the way we interact with our most used tool yet: the computer.

Human Computer Interaction (HCI) used to be seen as an esoteric subject: one that was not scientific, but merely emotional. Around 1945, scientists started to realize that it was necessary to take into consideration how were we going to interact with machines: new knowledge was not reaching the people who could benefit from it. In 1963, Ivan Sutherland introduced many of the ideas and concepts now found in interfaces today. In the early 1980's, scattered groups of computer scientists began an effort to look at the way users interacted with computers and their applications. The first of what has become the annual Computer Human Interaction (CHI) conference was held in Gaithersburg, Maryland. Issues like usability and human factors, came to

be considered when developing new products. The term "user-friendly" became a household word. Because no single interface was likely to satisfy all needs, a more formal look was taken at human-computer interaction. A new branch in Computer Science research was officially born. This issue of *Crossroads* tries to show you some aspects of that research, by investigating large-scale and small-scale projects in the area. No matter how you're reading this, we hope you like the interface.

We begin this issue by examining "Techniques & Tools for Using Color in Computer Interface Design". When you consider the tremendous public preference to buy a color monitor, instead of a monochrome monitor, the impact that color has in computer usage becomes more obvious. This article explains why color is an important part of Graphical User Interfaces and how the use of color can have a major impact in the effectiveness of an user interface.

Next, we look at the importance of "User Interface Correctness". User interface correctness can be easily taken for granted. When considering medical, military, or even financial applications, where lives, safety, and millions of dollars are at stake, the correctness of an interface becomes top priority. The authors make it clear that even "non-critical" applications depend on their interface's correctness, since they represent the systems themselves.

Our third article goes into a more often applied use of user interfaces. "Human Factors in Haptic Interfaces" presents the usefulness of haptic interfaces and how they expand and relate to our understanding of computer generated environments.

"Task Integration in Multi-modal Speech Recognition Environments" follows by presenting an in-depth look at speech-driven interfaces. Recognizing how this type of interface research has been pushed back for years, this article becomes part of a widespread effort to understand and better use speech-recognition in multi-modal environments.

To conclude, we present "An Investigation of Current Virtual Reality Interfaces". Visual, tactile, and navigational aspects are discussed. Also, user interaction and the importance of human factors in dependability and efficiency are brought up. Even when this relatively new technology has changed the direction of Human Computer Interaction, it brings together all of its important aspects in an almost dramatic way.

As before, we include the informative column, *Ask Jack*. We hope you enjoy it. Also

remember to Ask Jack about those questions about your future career in computer and information sciences that keep you up at nights (or distracted in class).

Let us know if you enjoyed this issue. You are always welcomed to send questions, suggestions, or to simply drop us a line at crossroads@acm.org.