Cognitive Science as the Engine of Innovation: Beyond Human-Computer Interaction

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Abstract

Successful sciences usually spawn successful applications and application disciplines; in fact, one is suspicious of a science that can't claim practical results. The na ve view is that results from the science are "applied" to problems, as in an "applied cognitive psychology," for example. The truth is more complex in general and it is particularly more complex for cognitive science. New advances in technology are amplifying still further the human role of informavore and the need for cognitive engineering and invention of cognitive products and government activities. The ability to meet these is a test of a cognitive engineering discipline and of the supporting sciences themselves. I am going to suggest some principles for organizing both cognitive science and the practical innovation around it by reflecting on what we have learned about using cognitive psychology in human-computer interaction. I will use this analysis to suggest a set of initiatives now within reach of the cognitive science community.

About Stuart Card

Stuart Card is a Xerox Research Fellow and the manager of the User Interface Research group at the Xerox Palo Alto Research Center. With Allen Newell and Tom Moran from CMU, he founded an effort to develop models of human performance that could be used in information system design. His thesis at CMU was the first thesis specifically in the new specialty of human-computer interaction. His study of input devices led to the Fitt's Law characterization of the mouse and was an important factor leading to the mouse's commercial introduction.

He and his group have developed a number of theories of human-machine interaction, including tne Model Human Processor, the GOMS theory of user interaction, and information foraging theory. They have developed new paradigms of human-machine interaction, including the Rooms workspace manager and the Information Visualizer. The work has resulted in nine Xerox products and the founding of Inxight Software, Inc.

Card is a co-author of the book, "The Psychology of Human-Computer Interaction", a co-editor of the book, "Human Performance Models for Computer-Aided Engineering", and has served on many editorial boards. He received his A.B. in Physics from Oberlin College and his Ph.D. in Psychology from Carnegie Mellon, where he pursued an interdisciplinary program in psychology, artificial intelligence, and computer science. His most recent book, "Readings in Infomration Visualization", co-written and edited with Jock Mackinlay and Ben Schneiderman, was published in January 1999.

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