Computer Systems
Technical Group

The Computer Systems Technical Group is concerned with human factors in the design of computer systems. This includes the user-centered design of hardware, software, documentation, related user tasks, and the environment in which the systems are used. Working within the broader context of the other wide-ranging subspecialties within HFES, practitioners and researchers in the CSTG community take a holistic, systems approach to the design and evaluation of all aspects of user-computer interactions. The immediate goal is to ensure that computer systems are useful, usable, safe and enjoyable. The overriding motivation is to enhance the quality of life by ensuring that computer systems provide optimal support for what the user wants to accomplish.

TECHNICAL FOCUS

Careers in this field are diverse because computer-based systems are used in so many different applications. People in this technical group conduct research or provide consultation to computer scientists and engineers building computer-based systems. Research focuses on improving the interaction between people and the computer systems they use. This research encompasses work on the physical compatibility between the user, the hardware, the cognitive compatibility between users and the computer systems they use to perform complex tasks.

Research has focused on how best to format data displayed on a computer screen, how to structure the menus of a word-processing application and how to improve training manuals. It also has focused on how keyboards should be designed, how to display symbols on the screen so that they are legible and easily perceived, and how input devices should be designed and how they are used. Research has also focused directly on specific computer-based products, such as text editors and spreadsheet packages, and on systems such as airplane cockpit displays.

Practitioners in this field commonly work as members of multi-disciplinary design and development teams. They are often involved in the design and evaluation of new hardware devices or new application. Many are involved in identifying user needs, prototyping and usability testing.

SUCCESS STORIES

CSTG members have been involved in a number of successful programs and products. Here are a few.

PERSONAL COMPUTER KEYBOARD
The objective was to design a small keyboard that could be used easily for diverse functions for the various applications of the personal computer. Functional grouping of keys, color coding, enhancing contrast ratios of characters and symbols, and using a stepped sculptured shape to minimize finger travel and provide keyboard adjustability met the objective. Customer sales and feedback on the keyboard were extremely favorable.

COMPUTER-GENERATED MAPS
One of the greatest problems faced in military operations is that of maintaining geographic orientation. The greatest hope for solving this problem is a worldwide digital map database and computer-generated maps. Human factors specialists have resolved many of the perceptual and

cognitive issues in the display of maps from digital data and have supported the development of a functional map system for the U.S. Army.

OLYMPIC MESSAGE SYSTEM

This system consisted of freestanding kiosks that were located on the grounds of the 1984 Los Angeles Olympics. The kiosks contained telephones and computer displays that were linked to a central computer. The kiosks allowed Olympic athletes to relay and receive voice messages from people either on or off-site.

CORPORATE INTRANET

The Web has rapidly become a critical method for the employees of large companies to get access to internal corporate information such as policies and procedures, company news, and internal applications. Recently, CSTG members were involved in a complete redesign of the Intranet for a large financial services company. Starting with online surveys to determine what features the users wanted from the Intranet, they moved on to prototyping of alternative design concepts, conducting focus groups with users, and usability testing. The results were a far more usable Intranet that greatly enhanced the productivity of the employees.

BENEFITS OF MEMBERSHIP

The CSTG, like other technical groups within the Human Factors and Ergonomics Society, performs a variety of functions and services for its members. In addition to sponsoring technical sessions at the Annual Meeting of the Human Factors and Ergonomics Society, the CSTG conducts special symposia on topics of interest to members. A newsletter is sent to all members several times a year. Additional information on the CSTG can be found in the HFES Web site http://hfes.org.

It is not necessary to be an HFES member in order to join the Computer Systems Technical Group.

ADDITIONAL READING

Readers who would like to learn more about human factors and computer systems should consult the following references:

Baecker, R., and Buxton, W. (Editors)(1995). *Readings in Human-Computer Interaction: Toward the Year 2000 (Second Edition). Los* Altos, CA: Morgan Kaufmann Publishers.

Dix, A., Finlay, J., Abowd, G.D. & Beale, R. Human-computer interaction. 3rd ed. New York : Pearson Prentice Hall, 2004.

Helander, M., Landauer, T., & Prabhu, P. (Editors) (1997). *Handbook of Human-Computer Interaction.* Amsterdam: Addison-Wesley.

Hix, D. & Harston, H.R. (1993). *Developing User Interfaces: Ensuring Usability Through Product and Process.* New York, New York: John Wiley & Sons, Inc.

Mayhew, D. (1999). *The Usability Engineering Lifecycle: A Practitioner's Handbook for User Interface Design.* San Francisco: Morgan Kaufman Publishers.

Perlman, G., Green, G., Wogalter, M. (Eds.) (1995). *Human Factors Perspectives on Human-Computer Interaction: Selections from Proceedings of Human Factors and Ergonomics Society Annual Meetings 1983-1994.* Santa Monica, CA: HFES.

Sears, A. & Jacko, J.A. The human-computer interaction handbook : fundamentals, evolving technologies, and emerging applications. New York : Lawrence Erlbaum Associates, c2008.

Sharp, H, Rogers, Y., & Preece, J. Interaction design: beyond human-computer interaction. 2nd ed. New York: Wiley, 2007.

Shneiderman, B. (1997). *Designing the User Interface: Strategies for Effective Human Computer Interaction, Third Edition.* Reading, MA: Addsion-Wesley Publishing Co.