

## THE COMPUTER SCIENCE *with* HCI

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**Abstract:** *The intention of this paper is to provide an overview on the subject of Computer science with Human computer Interaction. Human computer interaction (HCI) is the study of people design, implement, and use interactive computer systems. In this paper we study why do human uses computing system? , what do human uses computing system for? And the computer science of HCI.*

**Keywords:** *Human Computer Interaction, computing system, computer science of HCI.*

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### I. INTRODUCTION

Human-computer interaction (HCI) is the study of interaction between people (users) and computers. It is often regarded as the intersection of computer science, behavioral sciences, design and several other fields of study. Interaction between users and computers occurs at the rapid growth of computing has made effective human-computer interaction essential. Increased attention to usability is also driven by competitive pressures for greater productivity, the need to reduce frustration, and to reduce overhead costs such as user training. As computing affects more aspects of our lives the need for usable systems becomes even more important.

### II. HUMAN-COMPUTER INTERACTION:

The Association for Computing Machinery defines human-computer interaction as "a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them. Because human-computer interaction studies a human and a machine in conjunction, it draws from supporting knowledge on both the machine and the human side. On the machine side, techniques in computer graphics, operating systems, programming languages, and development environments are relevant. On the human side, communication theory, graphic and industrial design disciplines, linguistics, social sciences, cognitive psychology, and human factors are relevant.[1] Engineering and design methods are also relevant. Due to the multidisciplinary nature of HCI, people with different backgrounds contribute to its success. HCI is also sometimes referred to as man-machine interaction (MMI) or computer-human interaction (CHI). The human-computer interaction can be described as the point of communication between the human user and the computer. The flow of information between the human and computer is defined as the loop of interaction [2] [3]. The loop of interaction has several aspects to it including: Task Environment, Machine Environment, Areas of the Input Flow Interface, Output, Feedback

### III. WHY DOES HUMAN USE COMPUTING SYSTEM?

For millions of years, humans have used tools to ease the tasks they need to perform in order to survive. From historical tools such as chiseled-rock spear points to tools of the 21st century, humans have used their innovative talents and their enriched understanding of science to create technologies and tools to support their needs. Computing systems are the latest and arguably most complex tools that humans have ever created. Their use continues to evolve and grow as their speed and capability increase.

From their earliest days, computers were used for scientific, engineering, and cryptographic computations. Early human users of computers both wrote and read the bits that computers understood. With the advent of programming languages and translators such as assemblers and compilers, humans used characters (numbers, letters, and punctuation) and words to write instructions in ways that humans understood, and which translators turned into computer readable commands. Conversely, computers converted.

Ideas about what computers could do for humans grew as single stand-alone computers that performed only one set of calculations using data on external media such as tapes evolved into our multi-functional 21st century systems. More ideas came as networks of computing systems were built to transmit bits almost instantaneously around the world for other computers and software and people to use. In a seemingly never-ending cycle, new computer-enabled capabilities, devices, and environments are envisioned, developed, and deployed for use by ever larger, more diverse, and more demanding populations. These human activities have greatly expanded computer usage.

#### **IV. WHAT DO HUMAN USE COMPUTING SYSTEM FOR?**

Computing systems have become part of almost all the human activity. The following are key areas in which computing systems are used:

1. National defense and national security
2. The workplace
3. Education and training
4. Health care
5. Manufacturing
6. Research and development (R&D) in science, engineering, and technology

#### **V. THE COMPUTER SCIENCE OF HCI**

As progress in HCI is making user interfaces easier to learn and use, they are becoming more difficult to build. Simple command line interfaces were difficult to use but easy to program. Modern direct manipulation and virtual environment interfaces are easier to understand and use, but harder to program, largely because they have more possible execution paths. The area of Computer Science in HCI studies and develops the abstractions, techniques, languages, and tools to address this problem. This section of the overview discusses research and practice in the field of user interface software [5].

An important concept in user interface software is to separate the design of an interactive system into distinct levels, i.e., the conceptual, semantic, syntactic, and lexical levels, and to develop a design for each level.[6] Another significant concept is the user interface management system (UIMS), which provides a separate software component that conducts all interactions with the user, distinct from the application program that performs the underlying task.[7] It is analogous to a database management system in that it separates a function used by many applications and moves it to a shared subsystem. This approach separates the problem of programming the user interface from each individual application and permits some of the effort of designing tools for human-computer interaction to be amortized over many applications and shared by them.

Since user testing is an important part of good interface design, techniques for rapidly prototyping and modifying user interfaces are needed. For this purpose, one needs methods for specifying user interfaces that are precise, so that the interface designer can describe and study a variety of possible user interfaces before building one, and that allow rapid, perhaps automatic production of prototypes for user testing.

In addition, we will consider interaction styles, from conventional command language and menu-based styles to newer direct manipulation and virtual environment styles and interaction techniques for using devices to perform tasks in an interface.

In a graphical direct manipulation style of user interface, a set of objects is presented on a screen, and the user has a repertoire of manipulations that can be performed on any of them. This means that the user has no command language to remember beyond the standard set of manipulations, few cognitive changes of mode, and a reminder of the available objects and their states shown continuously on the display. Examples are spreadsheets, the Xerox Star desktop and its descendants such as the Apple Macintosh, and, of course, many video games.

Recent work has carried the user's illusion of manipulating real objects still further. By coupling a the motion of the user's head to changes in the images presented on a head-mounted display, the illusion of being surrounded by a world of computer-generated images or a virtual environment is created. Hand-mounted sensors allow the user to interact with these images as if they were real objects located in space surrounding him or her.

#### **VI. CONCLUSION**

The subject of Human Computer Interaction is very rich both in terms of the disciplines it draws from as well as opportunities for research. Discussed here was just a small subset of the topics contained within HCI. The study of user interface provides a double-sided approach to understanding how humans and machines interact. In this paper, I have presented the interactivity of human computer interface where the human can interface with the machine.

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