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Abstract

1 Introduction

2 History

In 1946, the ENIAC computer was completed for the United States Army and it has been argued whether ENIAC is to be seen as the first digital computer[**?**], or if this title actually belongs to the ABC computer (1942)[**?**]. Regardless, it is clear that the history of the underlying computer interfaces used is longer than the history of the computers themselves.

Already in the beginning of the 18th century Basile Bouchon started using perforated paper to control the textile looms used for weaving[citation needed]. To control the cords of a warp thick paper rolls were punched with patterns of holes, each column corresponding to a cord. The cords were then raised or lowered, depending on whether the paper was punched or not. In this manner Bouchons machine managed to automatise part of the weaving process, and allowed for more complex weaving patterns. Although punched cards were first invented in the 18th century, they were used as means of interaction both by the ABC and the ENIAC right at the beginning of modern computer history, and saw continued use until NÄR? [citation needed].

3 Herman Hollerith and the Census Problem

By the end of the 19th century the Bureau of the Census in the United States were having a problem. The Census is the agency in charge of keeping records of the population, and due to heavy immigration, the amount and complexity of the system was rapidly increasing. At that time, the Census was performing a population count every ten years - a process taking years to complete. In 1889, the director of the Census advertised a competition for the 1890 census tabulation system. The competition involved tabulating the St. Louis population district information from the previous 1880 census. The winner of the competition was Herman Hollerith, a former employee of the census bureau, with his electric tabulating machine.[citation needed, chapter 4]

Hollerith's tabulating machine was a success, and the contract was renewed also for the 1900 census. In order to expand the custormer base for his tabulating machines, Hollerith founded the Tabulating Machine Company in 1896. His company was one of three companies that in 1911 merged to form the Computing Tabulating Recording Company (CTR) - later renamed IBM.[citation IMBHISTORY]

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4 Current

5 Future

6 Special-Purpose Devices

Many societies today use computers for the most diverse set of tasks. Computers have become such an integral part of our society that persons with handicaps that prevent them from using computers are at risk of getting left out of large parts of society and work opportunities. While the computers themselves are TODO of handicaps, the input and output devices present the user with accessibility problems. Persons with sight handicaps (TODO rätt ord?) are mostly concerned with output devices, since most output devices rely on eyesight, like bitmap displays or status LEDs. This can be circumvented with accessibility tools like Apple Inc's VoiceOver which reads the text and describes the interface shown on the display.

The input devices are much more diverse in their designs, because they need to adress a larger set of handicaps. The output devices mainly focus on sight, and somewhat on hearing (visual alerts – hitta reference), while input devices have to focus on the whole spectrum. Two main categories of special-purpose input methods are devices to aid persons with reduced motor skills, and persons with reduced or no eye sight.

Devices that aid persons with reduced motor skills [kommer i olika former] depending on what they are meant to concquer. In some cases the use of hand controlled devices is a problem, which has produced a lot of research on foot controlled devices. AUTHORS describe SOME PRODUCT that DOES SOMETHING WITH THE FEET. MORE INFORMATION. Another set of devices are designed to aid persons that have lost most motor skills. AUTHORS describe devices that are controlled using eyes or facial features that do not require any other movement. These devices are called gaze communication devices. Devices that use gaze communication, as described by AUTHORS, MULTIPLE_REFERENCES are designed to allow persons who have extensive motor skill handicaps to use a specialised pointing device for controlling the computer. These devices rely on facial features and actions for controlling the cursor on the display, like nose tip and pupil movements for cursor movements and blinking for performing click actions.

Other special-purpose input devices are designed to help persons of other handicaps, and are designed for overcoming different accessibility problems. AUTHORS REFERENCE describe a special-purpose input method, designed mainly for smart phones and tablets which use touch screens, to input text using Input Finger Detection (IFD). While most smart phones today have some kind of input method to aid blind or low vision users, like Apple Inc's solution that reads the selected virtual key, and the user selects it by double tapping the display, the special purpose device allows the user to enter text in a much faster pace. AUTHORS input method is called Perkinput, and it allows the user to enter Braille letters directly by tapping fingers on the display. The Braille alphabet is built using a 2x3 bit matrix where each letter has certain bits "up" or "down". For two hand Braille input the user taps up to six fingers on the display, each finger representing a point in the Braille letters. The letters can be entered using one hand by first entering the left column with three fingers, followed by the right column with the same fingers. To enter the letter B, which can be seen as having the binary representation 110000, the user would press the two first fingers on the display to represent 110, and then do a one finger swipe to represent the remaining 000. The input rate of this special-purpose method is according to AUTHORS one handed Perkinput is evidentially faster than the iPhones standard input method, and two handed Perkinput is more than twice as fast.

$$\underset{\text{(a)}}{\begin{array}{cc} \bullet & \circ \\ \bullet & \circ \\ \circ & \circ \end{array}} \qquad \underset{\text{(b)}}{\begin{bmatrix} 1 & 0 \\ 1 & 0 \\ 0 & 0 \end{bmatrix}} \qquad \underset{\text{(c)}}{110000}$$

Figure 1: Three representations of the Braille letter B; the regular representation (a), a matrix representation (b), and a binary representation (c).

This comparison shows the difference a special-purpose device can make in the effectiveness of computer use related to adapted standard input methods.

7 Discussion

8 Proposed Future Work