Background Research

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Introduction

Videogames have a long and successful history that reaches back long before the invention of the personal computer that we know today.

Consoles and Arcade Systems had individual controls and buttons, designed to fit the needs for the actual game - videogames on the computer all share the same Interface and are almost exclusively played with keyboard and mouse, no matter what genre or type of game is played.

Since the computer was designed to be a working instrument, the capabilities do resemble them. In this paper, I would like to show some of the problems and limitations that modern gamers have come accross and what concepts have emerged to find solutions.

Exhibition 1

The Keyboard

The Keyboard is an array that harbors buttons. Most of them are reserved to hold the alphabet, just like a typewriter. Over the years, more and more buttons were added while some others vanished. Fact is, unless games are chatting among each other using text, the functions appended to those keys are completely irrelevant:
Videogames offer the user to rebind the proposed keys to different ones - whichever they might prefer or got used to. The gamer in turn choses the keys that are positionally best accessible - their intended use (letter, number, functional key) is mostly disregarded.

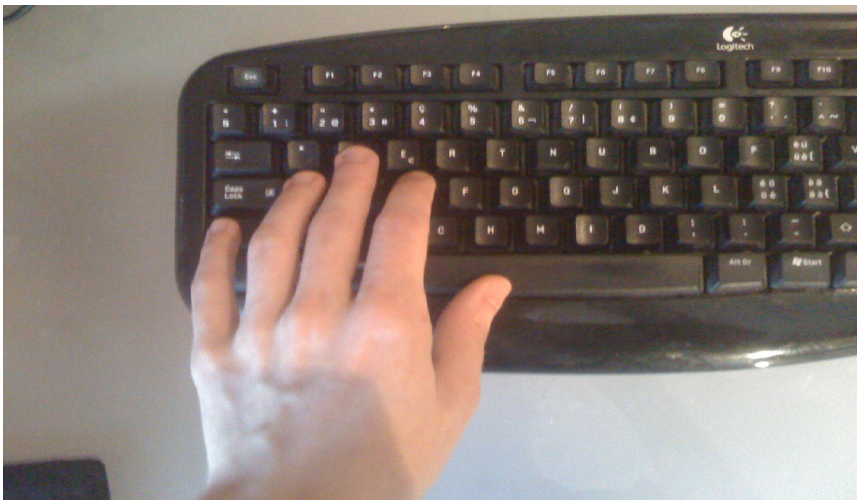
Since the user is free to chose which buttons he would like to use, the selection is usually packed tightly together around a central position on the left side of the keyboard.

It must to be said that only one hand is used to access keys, while the other remains on the mouse. The keyboard, however, was designed to be used both handed, thus the horizontally stretched layout. If only one hand is on the keyboard, the area which can be accessed (at the same time / without changing the centre) is physically restricted. The selection will naturally form a cluster reaching anywhere from 5 to about 35 keys.

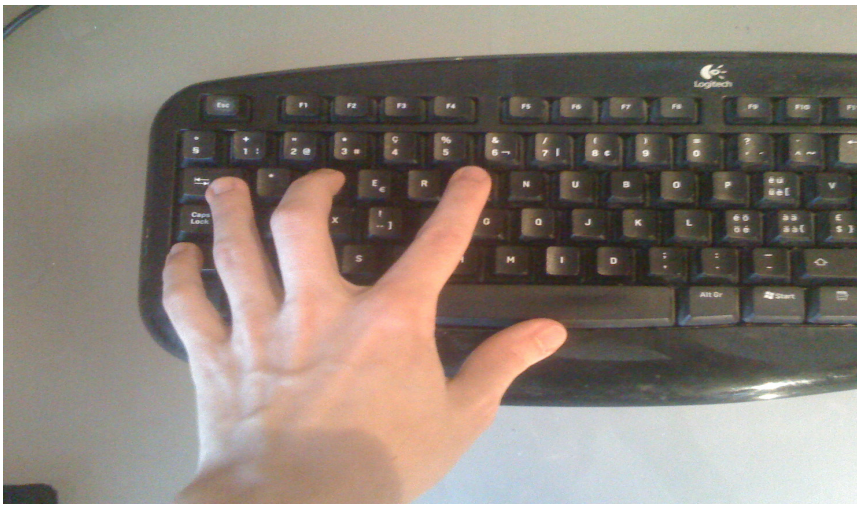
Exhibition 1

The Keyboard

In the following photographs, a hands-on example of a chosen configuration is shown. Note that even while many different keys are accessed by different fingers, the middle finger never moves too far away from its origin. It serves as a positional reference, just like the marked keys “F” and “J” do for typewriters.



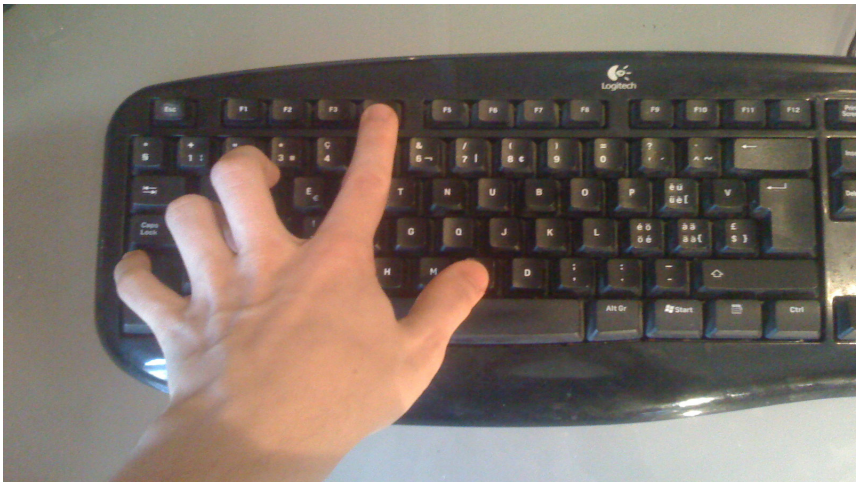
Phot. 1 “Idle Position”



Phot. 2 “Horizontal stretch Position”, reaching both the “TAB” and the “T” key

Exhibition 1

The Keyboard



Phot. 3 “Diagonal Position”
Reaching both “CTRL” and “F4”

In the next photograph, a configuration with a different centre is shown. It is a apparent that fewer keys can be accessed. But depending of the complexity of the game, it may as well be sufficient. Sometimes it can be worth changin to an entirely different area, for example to avoid a cramped posture, say if you’re left handed.

Phot. 4 “Arrows”,
Centre is formed around the “Arrows” of a keyboard, reaching an entirely different set of keys.

Exhibition 2

The Mouse

All Mice have at least one button, but their main purpose is to continually monitor the position of your hand in relation to the surface. All changes observed by the mouse are directly applied to the mouse cursor on the screen, which in turn can execute functions whenever buttons of the mouse are pressed.

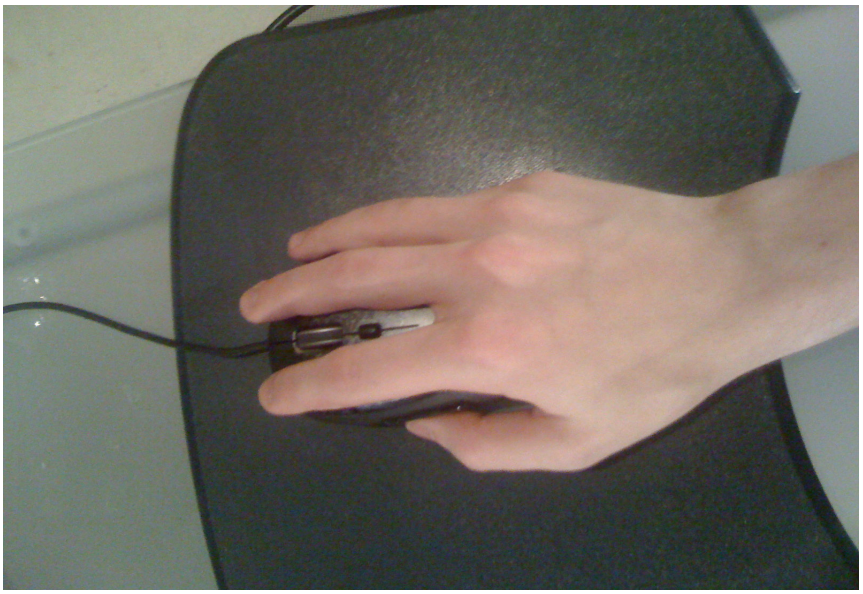
For gamers, it really does not matter if a button is physically installed on the mouse of on the keyboard. Like mentioned before, the functions appended can be replaced, and one might as well swap a mouse button with a keyboard button and go with that. The ability of the mouse to record horizontal and vertical movements of your hand however, can't be replaced by a keyboard.

The functionality of the keyboard can partly be overtaken by the mouse. Modern mice rarely ever come with only one button, or just two. Most have more than five, and for gamers, this makes perfect sense. As explained in Exhibition 1, the goal for a gamer is to have as much buttons available at any time, without moving your hand away from the centre of your cluster. Luckily, when working with a mouse, this will never be the case, because the hand carries the cluster around. This means that your fingers will always be able to reach all the buttons that are installed on the mouse, at any time, because it is a device that is designed to be kept in only one hand.
The limitations of this approach are size, shape

Exhibition 2

The Mouse

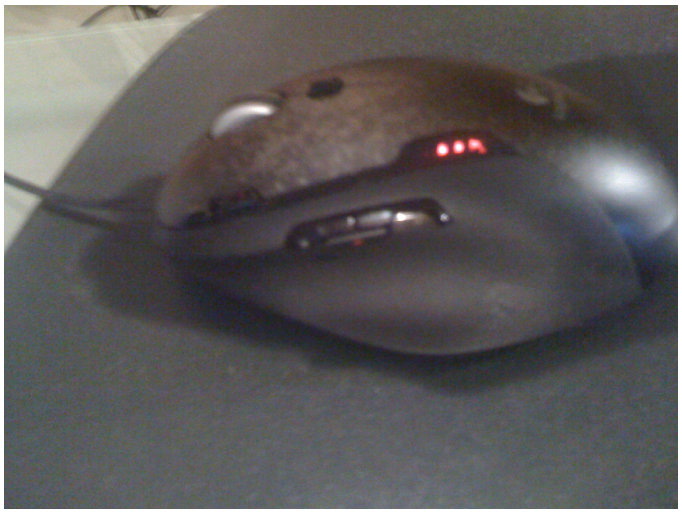
and weight of the mouse, which must be able to be lifted off the surface at any time with ease. Another limit are the fingers. Unlike on the key-board, here the hand cannot freely chose an area to work with. On the mouse, every area is clearly defined to for each finger. The thumb for example has a place to rest, but right above that of that there are multiple buttons that only the thumb can reach. This is true for every button on the mouse, with the possible exception of the mouse-wheel, which can be reached by both the index-, and middlefinger.



Phot. 5 Scrollwheel undefined

Exhibition 2

The Mouse



Phot. 6 These buttons are reserved for the thumb

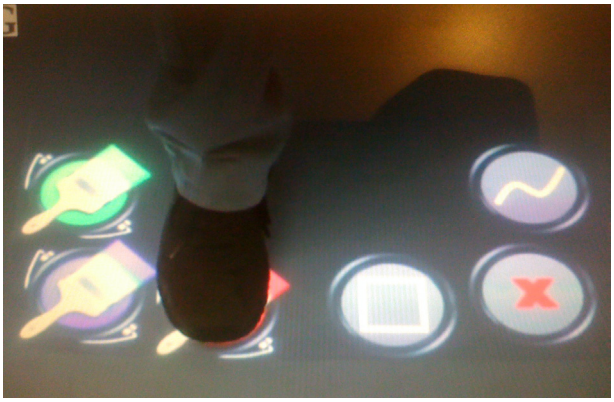
It comes with no surprise that the mouse has integrated some of the features belonging to the keyboard. This evolutionary step is prove that interfaces should learn from each other and that the same functions can coexist peacefully in different parts.

But there are difficulties, and that is if the user has to change from one device to the other, because the other is better suited for the task at hand. If those devices are intended to be used both handed, they are competing among each other for usage.

Exhibition 3

Multitoe

Without any further information on their source, a story has been posted on a news channel that "a team of german researchers" are working on a project that explores how touchscreen can be transformed to cover an entire floor, rather than a screen or a table, and they too, are using feet to register user interaction. They say that one application - among others - might be gaming.



Phot. 7 Feet controlling a Graphical User Interface

Phot. 8 + 9 Feet controlling the flow of a First-Person-Shooter

Exhibition 3

Multitoe

Phot. 10 Feet typing on a suface-based keyboard

The problem that I see with this Project is that that they are litterally taking a touchscreen and putting it onto the floor, which is just another 2d surface. They fail to see the possibilities of what can be done when incoorporating the third dimension, which is the distance of the feet to the ground you're standing on.

Conclusions

The role of gamers

Gamers are a driving force in the market of Computers. Graphically appealing games were long the only demand to develop evermore powerful computer components. And, in my eyes, the same is true for the interface which controls it.

It is worth looking how gamers are using an interface which was not intended to be used in their ways, especially when developing an interface that is designed to be used by them, but hopefully, not exclusively.