Casual Information Visualization System: SitUpright

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1. Work Detail

• Idea / Concept

The majority of the existing information visualizations(infoVis) are used data which is a regularly provided from professional fields, for example, the stock market or air pollution. InfoVis means that these kinds of professional data is then transformed into a useful information in a visual way. However, opposed to the example mentioned above, the infoVis becomes to expand for an exceptional purpose such as a common situation. This is called casual information visualization. "Casual infoVis is the use of computer mediated tools to depict personally meaningful information in visual ways that support everyday users in both everyday works and non-work situations."(Z. Pousman, 2007). As the definition mentioned, in casual infoVis, the use of data is reflected and influenced a large part of our daily lives, and therefore the user of this ranges from the professionals to the users. The artist is focusing on casual infoVis for personal habit such as sitting, standing or lying posture, period of smoking, driver's behavior, a number of electric uses, etc. To be specific, to start with SitUpright that is a research of habitual sitting posture, the artist will develop casual infoVis system about habitual physical action and, by extension, about habitual behavior. Also the artist's goal is to make up casual infoVis system that concentrate on entertaining expression than conveying information exactly to make actual change in daily life.

SitUpright, a tangible sensing and casual information visualization about the human sitting posture. In the modern society, a majority of people spend a large part of their time sitting in front of a computer looking at the screen at a work office. As this kind of time becomes longer, a proper posture of sitting would be important for their health. However, in many cases, people have their own personal habits of sitting, Those habits are only highlighted when one becomes ill, or diagnosed as serious problem. The human posture information visualization system, SitUpright, is able to aid to keep good sitting postures. The system firstly analyses the sitting position of the user using system, and encourages him to have a better posture.

2. Work Technical Details

• SoftWare

This work focuses on when a person is seated in front of a computer. Generally in the GUI design, in order for a comfortable and cordial environment, the peripheral information that does not need for continuous recognition is designed to be embedded into the main system in a a undisturbed manner. However, although a seating position does not needs continuous recognition, when the considerable transition is made, it should alarm it instantly to the computer user. Therefore, for this purpose, the essential used parts in GUI is modified to provide this peripheral but instant and informative data visually. There are two GUI applications of SitUpright. One is the mouse pointer, and the other is the bruise effect on my monitor.

Mouse pointer

In mouse pointer application, mouse cursor's direction and size continuously indicates the amount of the change of the seated posture. Since the cursor is already there always, small change with the mouse's direction and size will not be noticeable to the user. But when the user sitting posture is changed significantly, the mouse becomes bigger enough to hide the actual main contents which the user is looking at, and the change in direction of mouse will disturb to point the exact part of the point since it is off the conventional way. This will lead and encourage the user to go back to the previous better posture and eventually to have a better attitude in sitting.

This application creates a bruise effect on the monitor when the posture has altered badly. The monitor appears to be bruised if the user's position is shifted from the fitted seated position. The blackening part of the monitor because of the bruise indicates the seated position directed off from the proper position. As the user's bad posture prolongs, the blackening becomes larger and darker, and again the user senses some difficulty in using the computer. Thus this also encourages and assists to have a better seated position.

Casual infoVis System is application. In addition, the application visualize personal habit which comes from various sensor such as pressure sensor, camera, vibration sensor, etc.

- Hardware

In order to detect the users' movement when their sitting, the SitUpright system incorporated the Wii balance board as the hacked version and distributed the four sensors of it underneath the seat. To be precise, the four pressure sensors are embedded on the four corners of the chair (left-top, left-bottom, right-top, right-bottom). Therefore, once the user is seated in the chair, the data is produced through the four pressure sensors sense an alteration according to the movement of the user. Using the same principles as the Wii balance board, the data is transferred to the computer via Bluetooth technology. The data is then analyzed and the users' posture is then analyzed. This information is applied into an application. In the Wii balance board, the pressure sensor data is transferred into a computer as four decimal points. However, in SitUpright, we found that the data value lower than two decimal points is recognized as noise. Therefore only two decimal points are decided to be used. Another difficulties arose while designing this system is that since every person has different weight the four different data collected a different value which made the sensor difficult to judge the absolute value. Thus, we use the relative value from the four points instead. More in detail, from the individual values of the data collected from the four sensors, the total value is calculated and those individual values is re-calculated by ratio. And with this ratio, the system determines which area has relatively more pressure. Thus, the posture and the position the user is seated is analyzed by judging which side has identified more pressure by weight.

- Technical Details

Casual infoVis System is an application. In addition, the application visualize personal habit which comes from various sensor such as pressure sensor, camera, vibration sensor, etc. Casual infoVis system started from computer applications, but moreover it will develop smartphone applications or web application. To be specific, to start with sitUpright that is a research of habitual sitting posture, the artist will develop casual infoVis system about habitual physical action and, by extension, about habitual behavior.