Victoria
Word Count:600

9.1 – Scene Perception

Survival is the goal of evolution. Human vision has evolved in a way to help humans better survive in surrounding environment. Fast scene perception will help humans to spot objects and interact with the environment faster. It is a very complicated process and several theories have tried to explain the process. The coherence theory explains that the visual system has two levels in understanding the scene a low level volatile representation of the objects and a higher level which is stored in memory and can only hold objects that are attended to. The second level of the scene perception enables us to perceive changes in the scene and recognize changes. Triadic architecture adds a third process which works in parallel and interacts with the coherence theory levels. The third process enables us to quickly get enough information about the scene itself and help the object finding and navigation of the second level in coherence theory (Oliva 2005). In this essay I will provide examples of how this knowledge could help us in designing better visual systems.

The ability of the human brain in understanding the gist of a scene could provide some hints for designing video games. The results from research in scene perception has shown that humans can recognize a scene with very few details even a blurry image gives a sense about the scene to the viewer (Oliva 2005). In video games we usually have to render a very complicate scene with a lot of objects in background, since the gamers attention is usually focused on the character they have to control we can reduce the level of details of the background objects and environment. This will enable us to balance the computational power and focus this power on better rendering the character at focus; while still conveying the same sense about the environment to the gamer.

Another application that may benefits form the knowledge in this field is the browser. In a browser usually we send simultaneous requests for different elements of a web page. Different elements become available to the browser after time intervals proportional to their size in bytes. A clever design will construct the web using placeholders and replace the placeholder as soon as the element becomes available. This way when the first element of the page is displayed the viewer attention is focused on the displayed element meanwhile the other elements of the page are added unnoticed by the viewer. By the time the viewer attention is moved from the displayed object, all the elements are placed on the page. This gives viewer impression of the speed. The trick here is to properly choose the placeholders to give the same gist about the webpage as if the actual elements were there.

Change blindness is a consequence of how we perceive scenes (Rensink 2000). The concept is pretty simple if the change is not happening at our attentional focus it goes unnoticed. Using this knowledge we can design interfaces that are dynamic yet not disturbing. Imagine an intelligent editor which tries to provide recommendation as you type in the editor. For example if you are writing about Vancouver it can provide links to information about china town and other sightseeing places in Vancouver in a recommendation bar. The editor can update information on the recommendation bar when the user attention is focused on the editing area and stop changing and adding information to the bar when the user stops editing. This approach will enable application to provide useful information to the user while not disturbing her.

I provided examples about how knowledge about the scene perception in humans could help us in designing better visual systems in this essay.

References

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Rensink, R. A. 2000. “The dynamic representation of scenes.” *Visual Cognition* 7(1-3):17–42.