

Computer Graphics 1 – Literature Review 1

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The primary article chosen by me for my literature review is [Visualization beyond the Desktop-The Next Big Thing](#) and the secondary article which has a reference in the primary article is written by R.W. Picard and J. Klein, “[Computers That Recognize and Respond to User Emotion: Theoretical and Practical Implications](#),” *Interacting with Computers*, vol. 14, no. 2, 2002, pp. 141–169.

I particularly choose this primary article, as for me this is not just a casual article on Computer Graphics, it is what I while growing up was always curious about and hoped one day would eventually turn into a reality, I used to imagine while watching Television that one day I would be able to smell the food shown on TV and also literally feel the live action going on the TV. I know that the technology is not fully ready or developed at that level, but according to me we are closer than ever before to achieve this mean feat.

The second paper which is referenced in the primary paper is talking about prototypes of interactive computer systems have been built that can begin to detect, label aspects of human emotional expression and are able to respond to various human emotions such as frustrations along with other negative human emotions and be able to respond with emotions which will soothe the user or human sitting in front of their Computer screens. Which means these prototypes of machines can demonstrate human traits such as actively listening to the user and in turn showing empathy or sympathy to the user depending on his mood and emotional state. This paper (article) also talks in depth of how this is achievable by a machine such as a computer, as well talks about the repercussion of this powerful tool, which makes machines closer to understanding actual human’s psychology what causes a human to be happy, sad, upset angry etc. This lets the Computers enter into human Psyche, which in turn may not be a good thing if its extent is not controlled by us.

The following article talks in depth about the need to provide a support system to the users, who are lacking this emotional level of support from the real world (i.e. from other fellow humans). And what if a Computer can provide with this recognition or give the human the desired attention and emotional console he is looking out in the society. The need for this support is further supported by actual scientific experiments which observed the following, Human babies who are cleaned, fed and otherwise well cared for, but not held and touched affectionately for long periods, will often simply wither and die the cause of death called “failure to thrive” for want of understanding, as was noted in orphanages, early in the last century (SPitz,1945). This fundamental need of humans led the researchers to gather more data

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on this and were thinking of a way for computers to satisfy this human need of care and support. All these factors led the Computer designers and makers to consider this basic fact that if a user feels good about himself and is happy with a machine (computer) who can respond according to his needs and understand his personal mindset, though this is not implemented on a large scale yet. But the marketing guys agree to the fact that if users are satisfied, or feel good about using the product, or like the way it looks and feels, then, they may be more likely to buy it. Thus, these steps, while important, still fall short of honoring the full value and role of human emotion.

The article also further talks about what kinds of emotional needs of human tend to have on day-to-day basis that, if unmet, can significantly degrade quality of human life and if met, can improve the quality of life. In the article an analogy is made of how not necessarily the emotional support needed by humans may not necessarily be required from fellow humans, For Example: a pet such as a dog, cat or even a soft toy teddy bear owed by the user may also provide the human with a calming effect after being greeted by his pet, or after hugging his teddy bear. So why not a computer who could do the same on an emotional level by doing calculations in its CPU to understand user needs and if it is programmed correctly it might even succeed in giving the much required soothe to the user.

In Conclusion the article states that , Though it is seen how caring a computer machine can be for a User , it does not support the goal of developing human-computer interactions to replace human-human interaction, they acknowledge the fact that human-human interaction can sometimes leave a void which can be filled by a computer or in times of absence of a human anchor a computer can provide for the required emotional support.

Now the primary article talks about not only providing emotional support to the User , but also how a computer can be designed or made in such a way that a User may experience it to be real entity when he is operating it or around it, as well as how the computer can also target not only the visual and audio sense of humans as it has done conventionally, but moreover the user must be able to touch, swipe, grasp, smell and for the matter of fact even taste data.

The primary article named :

(**Visualization beyond the Desktop**—the Next Big Thing is written by a bunch of researchers

Jonathan C. Roberts and Panagiotis D. Ritsos ■ Bangor University

Sriram Karthik Badam ■ University of Maryland, College Park

Dominique Brodbeck ■ University of Applied Sciences and Arts Northwestern Switzerland

Jessie Kennedy ■ Edinburgh Napier University

Niklas Elmqvist ■ University of Maryland, College Park)

Talks in detail of the above mentioned technologies which need to be developed to their full potential in the future along with ways to go about it to achieve the technological metamorphosis.

The transformation of data into a visual form is important. Now, we can map the data to any sensory modality, not just the visual one. This idea has been around for a while, for instance Geiger counters often produce an audible click for feedback, mobile phones vibrate when receiving a call, message etc. we interact with touch devices every day. We can use these different modalities to both perceive and interact with it.

Some examples of these types of devices are HMDs (head mounted displays) such as Google Glasses, also gaming devices such as Nintendo Wii and Microsoft's Kinect along with others. These devices are becoming cheaper and public seems to be gradually adopting them and are comfortably using them with ease. Interaction is allowing users to change parameters, select values, filter away data points, zoom in and zoom out and perform other operations on data. Interaction is becoming a more sensory experience.

The article further states that we rely on our vision, hearing, touch, smell, and taste for interacting with the world. Because we use these senses every day, we're heavily accustomed to processing information this way. It becomes desirable for us to use the same approach to interact with our data and information. Consequently, many researchers are developing ubiquitous-analytics systems with novel multisensory interaction technologies that will let us interact with data in ways that are natural to us and therefore easy to understand. So, multisensory visualizations that employ the modern devices' various input and output modalities will be the "next big thing." We'll be able to touch, feel, smell, and even taste our data. Although no systems currently integrate all five of the traditional senses, researchers are heading toward this goal.

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Nonetheless, even though employing various senses for visualization might sound like a great idea, utilizing all the senses might not be necessary also it might become overwhelming for the user to operate such a device. Therefore, we must be able to strike a balance between the two.

There are two types of researches going on, first to study how our senses complement each other and under what circumstances and second to integrate many different technologies to stimulate as many senses as possible. Eventually, researchers will combine different input and output surfaces to create coherent, large-scale dedicated visualization environments. Although these environments will be expensive and somewhat difficult to use, they'll enable intense, collaborative data analysis on a scale not previously possible with standard desktop systems. As interaction with machines and devices becomes more natural, they'll become more pervasive and transparent. We'll see input and output technology starting to be integrated into our environment further diminishing the gap between the virtual and real.

After reading and comparing the two articles I would like to summarize it by saying, that even if all this new and next generation technology seems very fascinating, we must not forget why they were developed in the first place i.e. to make interaction with them simpler plus efficient in addition to be able to use the technology as per our needs and not the other way around where we get consumed by technology and it starts controlling us. And no matter how much the technology advances it would not be enough to replace or substitute human-human interaction.