

## **Texture Applications to Visual Design**

Texture could be defined as the surface property of a material that can be experienced through the sense of touch [1]. It is visual, but it provides the illusion of physical texture or surface roughness [2] that gives people who are observing it a strong urge to touch it. This physical quality gives the texture a sense of realism and a 3D perception of a textured object. A careful usage of texture could be a powerful force in various designs. This essay provides some examples where texture is effectively used: on maps, web designs, simulators, and 2D graphics.

### **Texture in maps**

Using texture in maps provides a sense of realism as well as it helps to emphasize different features and details on a spatially constrained area. Displaying multiple variables (e.g. geographic and environmental conditions) on the same map using only colors could lead to ambiguity as the number of variables increases. This even becomes more difficult when printing and color blindness are taken into consideration. Combining texture with colors would increase the number of patterns that could be used to visualize the multivariate elements [3]. Thus viewers would have a rapid and effortless visual exploration of the map.

### **Texture in Web designs**

By adding a texture to a web design, it signals a user's brain to real life items (wood, concrete, trees, ocean, etc) which creates a sense of physical quality and realism. This realism may result in a more emotional response from users which could help to bridge the gap between real items and digital objects; thus attracting the user and grab their attention. Designers could use texture to create focus by creating correct hierarchy, and make a viewer feel more connected and in-touch with the design [4].

### **Texture in simulators**

Simulators are used in various contexts to imitate real process such as technology, training, education, and video games. One of the key issues in designing simulators is realism and scene details which could be enhanced using texture. This realism could be achieved by using textures obtained from real images. For example, using images of real tissues, organs, etc in medical simulators has increased the realism of visual rendering which implicitly increased the quality of medical diagnosis and surgery planning simulators [5]. Providing various textures in these simulators allows trainees or users of such systems easily distinguish different diagnosis or cases within a system leading to an effective learning.

### **Adding a third dimension to images**

Texturing could be used in images to add depth by adding more visible texture to objects that should look closer to the viewer than distant objects [6]. This technique is widely used in art and computer graphics which is called texture gradient. It gives a 2D image an illusion of distance which is perceived as a third dimension. This illusion could also be achieved by manipulating the size unit [7] of the objects where further objects look smaller than closer once. Figure 1 illustrates how depth is achieved using these techniques where cobblestones in the road get less textured and smaller as the road depth increased.



Figure 1 Paris Street: A Rainy Day by Gustave Caillebotte [8]

With careful texturing, designers could also give familiar objects to viewers an illusion of volume, roughness and realism as shown in Figure 2 where texture gives an object the feel of stiffness. This creates a three dimensional perception even though it cannot be felt.

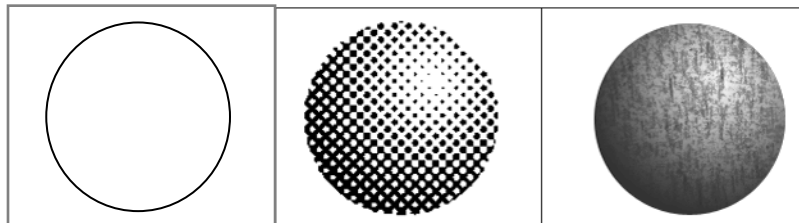


Figure 2 Texture creates a volume that looks realistic [9]

Even though there are many examples where texture is effectively used, designers still need to pay a careful attention when applying it. Texture is an important part of many designs and systems, however; it could create ambiguity and overwhelm viewers when badly used.

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