CSC 406 Assignment

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Level: 400lvl

Question(s): Define Visual Perception and write on the three factors associated with visual perception

Answer(s):

1. Visual Perception is the information received by the visual apparatus which must be filtered and passed to processing elements which allows one to recognize coherent scenes, disambiguate relative distances and differentiate color.
2. I) Perception of size and depth: This is the visual ability to perceive the world in three dimensions, coupled with the ability to gauge how far away an object is? Depth perception, size, and distance are ascertained through both monocular (one eye) and binocular (two eyes) cues.

Example: If we go to a hilltop scene there are a number of cues, which can use to determine the relative positions and distances of the objects, which we see. If objects overlap, the object that is partially covered is perceived to be in the background, and therefore further away. Similarly, the size and height of the object in our field of view provides a cue to its distance. A third cue is familiarity: if we expect an object to be of a certain size then we can judge its distance accordingly.

II) Perception of Brightness: Brightness is in fact a subjective reaction to level of light. It is affected by luminance, which is the amount of light emitted by an object. The luminance of an object is dependent on the amount of light falling on the object's surface and its reflective prosperities.

Although brightness is a subjective response, it can be described in terms of the amount of luminance that gives a just noticeable difference in brightness. However, the visual system itself also compensates for changes in brightness. In dim lighting, the rods predominate vision. Since there are fewer rods on the fovea, object in low lighting can be seen easily when fixated upon, and are more visible in peripheral vision. In normal lighting, the cones take over.

III) Perception of Color: Color is usually regarded as being made up of three components:

* hue
* intensity
* saturation

Hue

Hue is determined by the spectral wavelength of the light. Blues have short wavelength, greens medium and reds long. Approximately 150 different hues can be discriminated by the average person.

Intensity

Intensity is the brightness of the color.

Saturation

Saturation is the amount of whiteness in the colors.

By varying these two, we can perceive in the region of 7 million different colors. However, the number of colors that can be identified by an individual without training is far fewer.

The eye perceives color because the cones are sensitive to light of different wavelengths. There are three different types of cone, each sensitive to a different color (blue, green and red). Color vision is best in the fovea, and worst at the periphery where rods predominate. It should also be noted that only 3-4 % of the fovea is occupied by cones which are sensitive to blue light, making blue acuity lower.

Finally, we should remember that around 8% of males and 1% of females suffer from color blindness, most commonly being unable to discriminate between red and green.