Monday Roundup - 27th October 2008

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Choosing where to look next

Researchers in Switzerland have some of the features of a scene that might shift our attention,according to a paper in October's issue of the journal Cortex [1].

The researchers studied healthy volunteers as well as a number of patients that had suffered damage to the right hemisphere of the brain. Of those suffering brain damage, around half suffered from spatial neglect, a condition that leaves a person unaware of objects in one side of the visual field.

The researchers found that the involuntary eye movements (saccades) of healthy and brain damaged volunteers without neglect tended to land on areas of an image that had high contrast and many edges.

The neglect patients on the other hand were much less likely to land on areas with high contrast and many edges in the side of the visual field that they neglected. However, on their 'good' side, these patients tended to fixate on areas of the image that were rich in edges.

According to the authors of the study, these results suggest that attention is paid to the whole scene, in order to determine where the eyes will fixate next.

Surprise moves eyes

A paper in an upcoming edition of Vision Research [2] shows that a measure based on the statistical properties of an image can predict where people will direct their attention in a moving image.

Laurent Itti and Pierre Baldi showed short video clips to eight volunteers and measures 10,192 eye movements. They also analysed the videos in order to extract low level features such as contrast, colour and movement in each area of the image.

The researchers found that, using Basyesian statistics they could identify areas of some frames in which these low level features changed in a way that was unexpected given what came before. These areas in the images were most likely to be fixated on by the volunteers when viewing the videos.

The authors said: "We find that surprise explains best where humans look. [Surprise] represents an easily computable shortcut towards events which deserve attention."

Rivalry rivalry reconciled

Vision researchers often use 'rivalry stimuli' in order to study people's consciousness of a visual stimulus. These types of stimuli have two (or more) interpretations, and viewers' perceptions will 'flip' between one and the other. There are two types of rivalry stimuli: binocular and perceptual and, until recently, it was thought that these acted on conscious perception in different ways.

In the 1960s, Willem Levelt laid down a set of propositions that determine the strength and rate of reversal in binocular rivalry - where each eye receives a different image. Levelt described the ways in which binocular rivalry stimuli could be manipulated in order to change the viewer's conscious impressions of them.

In perceptual rivalry, the same image is presented to both eyes, but the viewer is still conscious of two or more different interpretations because the image is ambiguous. The most famous example of perceptual rivalry is the Necker cube.

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