عنوان مقاله:

Gaze Control: a Window to Understand How the Mind Works

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خلاصه مقاله:

Cognition is an umbrella term that refers to sensations, perceptions, actions, and intelligence. Sensory systems detect a limited range of signals from the physical world. Perceptions are forms that are constructed to understand the received sensory signals, by distinguishing relational regularities in sensory signals. Actions are behavioral strategies designed and adapted to make changes to the perceptions, e.g. motor movements to change body perception. Intelligence refers to capabilities in analysis of sensations and perceptions, going beyond them, and constructing new forms of perceptions and actions. Gaze control can be used to study all of these capabilities and their various forms, hence opening a window to understand how the mind works.Methods: Gaze control can be a sensory-based action. In response to appearance of multimodal events in the environment, we often make a gaze-shift in order to focus the attention and gather more information. The spatial goal of such a gaze-shift is determined by distinctiveness: 1) unimodal feature contrasts (e.g. luminance, color, and orientation in vision, or pitch differences in audition), 2) multimodal feature similarities. Studying the sensory control of saccades opens up the opportunity to reflect on sensory processing mechanisms in the brain.Results: Gaze control can be a memory-based action. In everyday activities, fixations are made in the service of locating objects and performing manual actions on them, rather than on the basis of stimulus distinctiveness. A concept is an abstract construction of some components to achieve a funciton. Concepts are instantiated by systematic and context-dependent shifts of attention to its components. Scenes are concepts of visual object features. A scene is seen when it is systematically and contextually instantiated by making saccades to its different positions. Therefore, studying the saccade sequence patterns can be a source of understanding the cognitive mechanisms that control them.Conclusion: Behaviorally, gaze control is a motor movement problem. Rotations of the line of sight are mainly implemented by coordinated motion of the eyes and head. This includes a complex coordination of a saccade towards the target, a more sluggish head movement and usually the vestibulo-ocular reflex (VOR) which keeps the eye on target during the latter parts of the head motion. .Studying these kinematic mechanisms points us to understand general motor mechanisms applied by the brain

کلمات کلیدی: