Cluster Fix: An Eye-Tracking Algorithm for the Measurement of Fixations and Saccades

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Technology description

Market Summary

Eye tracking technologies are instrumental for companies to evaluate consumer interactions with websites, advertisements, software, package designs, and any other media. With minimal user involvement, it provides instantaneous feedback on the reaction of consumers to target stimuli. Furthermore, eye tracking is employed in medical testing to investigate and diagnose disorders such as Alzheimer’ s disease, schizophrenia, ADHD and autism. Advanced eye tracking technologies are also being applied in smartphone devices which allow users to control features without touching the screen, as well as in communication systems for disabled people, enabling them to perform a number of activities using only their eyes.

Technical Summary

Eye tracking technologies measure the motion of the eye and determine how long the attention of a subject is focused on each region of an image. By examining fixations, saccades (rapid eye movement as fixation point changes), and other eye activity, researchers can gauge the reaction of the subject to any given stimuli. Existing algorithms for detecting fixations and saccades often used arbitrary and inaccurate eye velocity and acceleration thresholds. Emory researchers have developed Cluster Fix, an algorithm which uses k-means cluster analysis on a combination of distance, velocity, acceleration and rotation measurements of eye motion to detect fixations and saccades with increased precision. Furthermore, Cluster Fix increases sensitivity by globally and locally evaluating scan paths, thus allowing the detection of small saccades and the precise identification of the start and end of saccades.

Application area

Software for more precise measurement of fixations and saccades during eye motion tracking.

Advantages

Increased precision by combining distance, velocity, acceleration and rotation measurements.
Increased sensitivity by globally and locally evaluating scan paths.

Institution

Emory University

Inventors

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