Human Factors

research and technology division

Video-Based Head and Eye Tracking

Objective

To measure eye movements in situations where the subject is free to move about. The sequence and duration of fixational eye movements can provide insight into the cognitive processes underlying the performance of complex tasks.

Approach

A miniature head-mounted camera provides a magnified view of the subject's left eye, while a forward-looking scene camera provides a view of the environment in the direction the subject's head is pointing. The eye camera images are analyzed to provide direction of gaze relative to the head; combined with an analysis of the scene camera images, which provide information about the position of the head, fixated objects can be identified in the scene.

Impact

The use of a purely video-based system allows remote measurements to be made using a compact portable electronics package, providing video data which can be recorded or transmitted to the laboratory. Eye fixation analysis applied to aerospace tasks such as air traffic control may provide insights leading to improvements in user interface and automation design.

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