Monitoring covert cognitive states for predicting mental workload

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ABSTRACT:

The current work focuses on a key area relevant towards enhancing warfighter capabilities: operator workload. Knowledge gained from this work may impact important military areas including the ability to predict instances in which operators do not have much spare capacity to deal with unusual or rare situations. One of the most important challenges for research in this domain is to assess the operator functional state of individuals engaged in real world tasks, and to fully understand the factors that may affect this complex construct. Monitoring covert cognitive states with an aim towards predicting operator workload may be beneficial in developing technologies that mitigate performance decrements including information overload and loss of situation awareness. Among the different psychophysiological measures of operator load, eye movements are relatively easy to collect in real operational environments. A technique often used in Human Factors /Ergonomics (HF/E) research that provides a different perspective from other eye-movement methods is the analysis of visual patterns. Issues related to using entropy and nearest neighbor index will be discussed.

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