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Construction and Validation of a Neurophysio- Technological Framework for Imagery Analysis

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Abstract. Intelligence analysts are bombarded with enormous volumes of imagery, which they must visually filter through to identify relevant areas of interest. Interpretation of such data is subject to error due to (1) large data volumes, implying the need for faster and more effective processing, and (2) misinterpretation, implying the need for enhanced analyst/system effectiveness. This paper outlines the Revolutionary Accelerated Processing Image Detection (RAPID) System, designed to significantly improve data throughput and interpretation by incorporating advancing neurophysiological technology to monitor processes associated with detection and identification of relevant target stimuli in a non-invasive and temporally precise manner. Specifically, this work includes the development of innovative electroencephalographic (EEG) and eye tracking technologies to detect and flag areas of interest, potentially without an analyst's conscious intervention or motor responses, while detecting and mitigating problems with tacit knowledge, such as anchoring bias in real-time to reduce the possibility of human error.

Keywords: Augmented Cognition, electroencephalography, eye tracking, imagery analysis