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Authors

Khosroshahi, Ehsan
Salvucci, Dario

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A Preliminary Model of Situation Awareness in a Cognitive Architecture.

Ehsan Khosroshahi
Drexel University, Philadelphia, Pennsylvania, United States

Dario Salvucci
Drexel University, Philadelphia, PA, USA

Abstract: Although maintaining situation awareness (SA) is a critical skill for many complex tasks, there have thus far been few rigorous computational approaches to modeling SA behavior and performance. We developed a preliminary computational model of SA focused on remembering the locations of static objects in the visual field. We built this model on the foundation of the ACT-R cognitive architecture, using its declarative memory and vision modules to specify the process of scanning the field and remembering object locations. In the current work, we demonstrate how this model accounts for human behavior and performance in two recent experiments: one, a study of object location memory with identities similar to air-traffic control call signs; and another, a study of remembering the location of shapes of varying size, color, and pattern.