Scan pattern adaptation during repeated visual search

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An Abstract of a Thesis Submitted to the Graduate

Faculty of Rensselaer Polytechnic Institute

in Partial Fulfillment of the

Requirements for the degree of

DOCTOR OF PHILOSOPHY

Major Subject: Cognitive Science

The original of the complete thesis is on file
in the Rensselaer Polytechnic Institute Library

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September 2007
(For Graduation December 2007)

ABSTRACT

Sequences of eye movements, or scan patterns, can be repeated across multiple views of the same visual stimulus. Research on skill acquisition has demonstrated that participants implicitly refine sequential behavior with experience (Gray & Boehm-Davis, 2000; Haider & Frensch, 1999), and that the refinement process may lead to improvements when the structure of the task environment is supportive of improvements. The current research extends the understanding of scan patterns by demonstrating that they can be adapted to specific stimuli as experience with the stimuli increases. Functionally adaptive scanning theory is introduced as a theory of when and how scan patterns are adapted to repeating visual stimuli. FAST maintains that scan patterns repeat across the same stimulus during visual search and that scan patterns can be refined with increased use of the same scan pattern. FAST predicts that repeating scan patterns are refined to reduce time on task while maintaining accuracy. Three experiments were conducted to test FAST. The experiments demonstrate that although explicit strategies may be brought to a search task, they are implicitly refined.