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13. ABSTRACT *(Maximum 200 words)*

During 1999-2000, Adrainne Seiffert was supported by this grant. She was in her last year of graduate studies. David Whitney, previously supported by this grant, received his own independent DoD funding but continued work on the projects he had begun under AASERT support. Susan Murunga completed a project during the year extending our work on object recognition. She received no funding but did participate in the grant supported projects, learning how to program and conduct experiments. In our model, recognition starts with an intial, crude 2-D match that selects a "best" protoype to explain the image data. David Whitney has extended this priming of gender recognition in images. Susan Murunga attempted to demonstrate the existene of this early prototype using classical conditioning.

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AASERT EARLY SCENE ANALYSIS: RAPID PROCESSING OF CONTOURS, SURFACES, AND OBJECTS IN HUMAN VISION

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1 September 2000

Final Progress /Evaluation Report for Period 1 September 1999 - 31 August 2000

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AASERT EARLY SCENE ANALYSIS: RAPID PROCESSING OF CONTOURS, SURFACES, AND OBJECTS IN HUMAN VISION

Objectives

This report covers the AASERT grant that is a companion grant to F49620-98-1-0122 of the same title. It covers the support and training of a single graduate student. The work has concentrated on how 2-D information is built up from the parallel analysis of a set of visual attributes and how this information contacts memory in order to construct 3-D representations of the visual scene.

Research Training Activities

Graduate Students.
During 1999-2000 Adriane Seiffert was supported by this grant. She was in her last year of graduate studies. David Whitney, previously supported by this grant, received his own independent DOD funding but continued work on the projects he had begun under AASERT support.

Undergraduates. Susan Murunga completed a project during the year extending our work on object recognition. She received no funding but did participate in the grant supported projects, learning how to program and conduct experiments.

Accomplishments / New Findings

Object recognition: positive priming. In our model, recognition starts with an initial, crude 2-D match that selects a "best" prototype to explain the image data. David Whitney has extended this to priming of gender recognition in images. Susan Murunga attempted to demonstrate the existence of this early prototype using classical conditioning.

Motion extrapolation, position distortion. When a target is briefly flashed beside a moving object, the flash appears to trail behind the object. Recent articles have suggested that the perceived location of a moving item is assigned ahead of its sensed location to compensate for the continued motion of the object during the inevitable delays of processing prior to perceiving the object. David Whitney showed that the effect is based on latency differences. He published two notes, one in *Nature Neuroscience* (Whitney & Murakami, 1998) and one in Science (Whitney & Cavanagh, 2000), and two articles in *Vision Research* (Whitney, Murakami, & Cavanagh, 2000a, 2000b). He followed this up with a discovery of a novel distorting effect of motion on the apparent position of distant, stationary targets. This was just published in *Nature Neuroscience* (Whitney & Cavanagh, 2000).

Visual search for motion. With AASERT support, Adriane Seiffert extended her studies of motion to address the role of attention in visual search for moving targets. A manuscript is in preparation.

Personnel supported

Personnel on the grant: Adriane Seiffert.

Publications supported by this AASERT grant in 1999-2000

Tse, P. U., & Cavanagh, P. (2000). Chinese and Westerners see opposite apparent motions in a kanji stimulus. *Cognition*, **74**, B27-B32.

Whitney, D., Cavanagh, P. (2000). The position of moving objects. *Science (Technical Comments),* **289**, 1107.

Whitney, D., Murakami, I., & Cavanagh, P. (2000). Illusory spatial offset of a flash relative to a moving stimulus is caused by differential latencies for moving and flashed stimuli. *Vision Research*, **40**, 137-149.

Whitney, D., & Cavanagh, P. (2000). Motion distorts visual space: shifting the perceived position of remote stationary objects. *Nature Neuroscience*, **3**, 954-959.

Whitney, D., Murakami, I., & Cavanagh, P. (2000). Temporal facilitation for moving stimuli is independent of changes in direction. *Vision Research*, in press.

Albert, M., & Tse, P. U. (1999). The role of surface attachment in perceived volumetric shape. *Perception.* **29**, 303-312.

Whitney, D., Murakami, I., & Cavanagh, P. (1999). Illusory spatial offset of a flash relative to a moving stimulus is caused by differential latencies for moving and flashed stimuli. *Vision Research*, **40**, 137-149.

Interactions, conference papers during 1999-2000 grant period supported by grant

Whitney, D. V., & Cavanagh, P. (2000). Motion adaptation shifts the apparent positions of remote objects. *Perception*, **29 Suppl.**, 75. (A)

Whitney, D., Cavanagh, P. (2000). Motion distorts visual space: Shifting the perceived position of remote stationary objects. *Investigative Ophthalmology & Visual Science*, **41**, S741.

Whitney, D., Murakami, I., & Cavanagh, P. (1999). Persistence does not influence the perceived location of a flash relative to a moving stimulus. *Perception*, **28 Suppl.**, 81. (A)