DETECTION AND RESOURCE ALLOCATION PROBLEMS IN ATR SYSTEMS

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This is the final report on research activity on the AFOSR AASERT grant P49620-98-0370 during the period beginning to end. The AASERT grant has permitted Professors Hero and Tenekezis to provide student RA support on the parent APOS MURI grant F49620-96-0028. The grant has supported three graduate students, Robby Gupta, Chris Lott and Thomas Kragh, on an alternating semester-by-semester basis (25% RA support by AFOSR supplemented by 25% support by other sources). Robby Gupta and Chris Lott completed their Ph.D. dissertations in their respective directions: (1) interaction between spatial resolution and detection/classification performance for automated target recognition; and (2) sequencing, scheduling, and resource allocation associated with the sensor management and distributed operation of an automated target recognition system. Thomas Kragh will complete his Ph.D. thesis defense in July 2002.

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Detection and Resource Allocation Problems in ATR Systems

AFOSR AASERT, Grant # F49620-98-1-0370

PI's: Alfred Hero and Demosthenis Teneketzis

The University of Michigan
Electrical Engineering and Computer Science
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Final Report

Period covered: 4/1/98 – 3/31/02
1. Objectives

This AASERT grant partially supported three graduate students, each working on one of two classes of related problems: (1) robust detection for multi-resolution automated target recognition; and (2) sequencing, scheduling, and resource allocation associated with the sensor management and distributed operation of an automated target recognition system. The students working on robust detection were supervised by Professor Hero; the student working on resource allocation and sequencing problems were supervised by Professor Teneketzis.

2. Status of effort

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3. Students Supported

Robby Gupta
Graduate student research assistant working under the supervision of Professor Alfred Hero.

Robby Gupta was supervised by Al Hero and graduated with his Ph.D in May 2001. In addition to his PhD thesis, one refereed journal publication has been submitted to the *IEEE Trans, on Information Theory* describing work related to this grant. This work is discussed in more detail in the final report on the AFOSR parent grant F49620-96-0028. Robby Gupta is employed at TRW, Los Angeles, California.

Thomas Kragh,
Graduate student research assistant working under the supervision of Professor Alfred Hero.

Thomas Kragh was supported on the grant during the last semester of the grant (ending in March 2002) during which time he worked on extensions of Robby Gupta's optimal vector quantization work. These extensions included optimal quantization for inverse problems and specifically optimal binning of tomographic projections (sensor surfaces) for the express purpose of target detection. He will defend his thesis in July 2002. In addition to his PhD thesis, a conference paper will appear at Asilomar in Nov. 2002, and a full length paper on this work is in preparation.
for submission to the IEEE Transactions on Image Processing.

Chris Lott Graduate student research assistant working under the supervision of Professor Demosthenis Teneketzis.

Chris Lott was supervised by Demos Teneketzis. Chris received his Ph.D degree in February 2001. His research resulted in 4 journal papers (one of which has been published and three are currently under review) and 4 refereed conference publications (see list of publications). The work documented in the aforementioned papers is discussed in more detail in the final report on the AFOSR parent grant F49620-96-0028. Chris Lott is currently employed by Qualcomm in San Diego, California.

4. List of Publications


