

DAGSI Research Topic

1. **Research Title:** Sensor Resource Management and Scheduling for Multimodal Sensor Systems
2. **Individual Sponsor:**

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3. **Academic Area/Field and Education Level**

Computer, electrical, industrial, mechanical, and related engineering disciplines (MS or PhD level)
Computer science and related disciplines (MS or PhD level)
Mathematics, statistics, and related disciplines (MS or PhD level)

4. **Objectives:** To investigate and develop advanced methodologies for sensor resource management and scheduling in systems composed of heterogeneous sensing modalities, such as electro-optical, infrared, radar, RF, acoustic, or other complementary sensors. The research will integrate optimization and AI to allocate sensing resources, schedule sensing actions, and prioritize sensing tasks under uncertainty, limited bandwidth, energy, compute, and time constraints. Emphasis will be placed on improving coverage, detection, tracking, and information gain while enabling adaptive decision-making in dynamic and contested environments.
5. **Description:** Multimodal sensor systems offer significant advantages in complex operational settings, but they also create challenging resource allocation and scheduling problems due to competing objectives, heterogeneous data streams, and rapidly changing mission needs. This project will develop optimization and AI-based approaches to coordinate when, where, and how different sensors should be tasked, re-tasked, or fused to maximize mission effectiveness. Potential directions include predictive scheduling, adaptive sensor selection, task prioritization, uncertainty-aware decision-making, and learning-enabled policies that improve robustness and generalizability across environments. The resulting framework is expected to support more efficient and explainable sensor management for target detection, tracking, situational awareness, and autonomous sensing operations.
6. **Research Classification/Restrictions:** Unclassified
7. **Eligible Research Institutions:** Any university in the State of Ohio

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