DAGSI Research Topic

1. **Research Title:** Situationally Aware, Intent-based Sensor Fusion and Generative AI
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)

4. **Objectives:**
   a. Develop machine learning methods for situationally aware intent-based sensor fusion systems that accurately predict the intentions or goals of target systems given historical and environmental perceptions.
   b. Develop machine learning methods for generating situationally appropriate behaviors and responses within dynamic multi-agent environments.
5. **Description:** Traditional data fusion methods focus on combining data from multiple sensors to estimate state variables such as position, velocity, and object classification. In contrast, an intent-based sensor fusion system aims to go beyond basic state estimation by predicting the true contextual meaning behind raw sensor observations as perceived by an AI agent. This enables situationally aware and goal-driven perception and decision-making, allowing the system to interpret events in relation to perceived intent. As a result, AI agents can exhibit more anticipatory behavior and enhanced situational awareness in complex real-world environments. Additionally, this system would include a generative behavior component, enabling AI agents to produce situationally appropriate behaviors aligned with the perceived intent and to interact collaboratively with other AI agents.
6. **Research Classification/Restrictions:** Unclassified
7. **Eligible Research Institutions:** Any university in the State of Ohio