Attachment 1 – DAGSI Research Topic Template

NOTE: Under the Cooperative Agreement, Technical Directorates have three options for topics. First, a topic can strictly be considered in the pool for the state allocation of funding. DAGSI will work across the TDs for this allocation. Second, the TD can be prepared to be a funding partner with the State of Ohio. This would include: providing additional funds to support additional recipients of a topic, or expand the proposers team to include additional members on a topic. Third, the TD may elect to fully fund a topic not selected for State of Ohio funding or to pursue University teams outside the State of Ohio. Contact Terry.Cunningham.2@us.af.mil for questions.

1. **Research Title:** Hyperspectral Anomaly Detection in Maritime Environments
2. **Individual Sponsor:**

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

   Electrical Engineering, Computer Science

4. **Objectives:** Improve hyperspectral anomaly detection in maritime environments by 1) modeling and creating algorithms to identify whitecaps and 2) generating more accurate cloud masks.
5. **Description:** Hyperspectral target detection often relies on atmospheric compensation to convert measured radiance data into a reflectance or emissivity to then match to library spectra for a given target. Maritime environments present challenges to this paradigm as atmospheric compensation is extremely difficult given the relatively flat and low reflectance of water and because we often don't have library spectra for targets of interest. Due to these challenges, we rely on anomaly detection to find anything is the scene that is different than water, however this also presents some unique challenges. Specifically, it can be difficult to distinguish anomalies that are relevant, such as boats, from things, such as whitecaps and clouds, which while statistically anomalous from the background are not of interest. This work will focus on how to reject these anomalies to focus on anomalies of interest in a scene.
6. **Research Classification/Restrictions:** This work will be unclassified, there will potentially be some distribution limited data/results so U.S. nationals only.
7. **Eligible Research Institutions:** All Ohio Universities

NOTE: Topics submitted to DAGSI must be approved for public release. Need PA Approval #