DAGSI Research Topic

1. **Research Title:** Automated image analysis of colorimetric detectors

2. **Individual Sponsor:** List the AFRL research topic sponsor's contact information

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

   Material science, Data Analytics/Machine Learning, Optics/Imaging
   MS/PhD

4. **Objectives:** Through imaging and machine learning investigate the ability to analyze and interpret liquid aerosol deposition patterns and color analysis on paper. Based upon images be able to characterize color, size and coverage patterns. From these parameters investigate the ability to determine the characteristics (concentration, dispersion pattern, etc.) of the source chemical.

5. **Description**: The US Air Force uses various types of colorimetric detection paper to identify the presence of hazardous chemicals in the environment.   The paper works by changing color in the presence of a liquid/vapor chemical agent. Currently the detection paper is interpreted by a human, and provides information on the presence or absence of a chemical threat although in some cases, the test systems can have been calibrated to flow. The specific objective of this project is to remove the subjective nature of how M8 paper, a test method for method for chemical warfare agents is interpreted. In addition to a simple presence or absence determination the project will investigate the ability to characterize the physical characteristics of the original aerosol based upon the deposition pattern. Ideally this capability would be automated and work on a standard smart device. It will also enable a standardized way to capture the field measurements as they are taken with geolocation, etc.

6. **Research Classification/Restrictions:** Basic research is unclassified but may be restricted to US citizens only.

7. **Eligible Research Institutions:**

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