

FY16 Student Research Topic

1. **Research Title:** Development of Visualization Tools and Techniques for Mass Spectral Data and Volatile Organic Compound (VOC) Sensor Development

2. **Individual Sponsor:**

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

Computer Science and Computer Engineering/Algorithm Design and Software Development
MS Level
Previous work with visualization, machine learning algorithms and software design is strongly desirable.

4. **Objectives:** The objectives of this research include 1) designing a suitable user interface for accessing the various facets of mass spectral data 2) developing informative visualizations of mass spectral data indexed by: subject class, subject, chronology, testing state, etc. 3) providing the capability to alternatively amalgamate and separate data clusters in a tree-like structure and 4) incorporating the interface with a volatile organic compound (VOC) sensor test platform.
5. **Description:** Inherent complexities in mass spectral data obfuscate influences on interpretation for such applications as determination of military aircraft air quality and aircrew health. More extensive collections spanning additional dimensions in: various airframes, individual pilots, testing location, and time should provide additional clues as to relationships in exposure and reaction, but only to the extent that the amassed data can be assessed and displayed to aid expert discernment. This collaborative project strives to achieve that goal. By collaboratively developing expert-guided visualization tools with the goal of aiding these same experts in the assimilation and interpretation of mass spectral and various data, we strive to enable an extension of current expert capability to further the state of the science on this critical issue.
6. **Research Classification/Restrictions:** Current investigators assigned to project carry a Confidential or higher security clearance. Applicants will be subjected to a full background check to obtain these clearance levels.
7. **Eligible Research Institutions (check all that apply):**

DAGSI (Wright State University, AFIT, Ohio State University, University of Dayton, Miami University, Ohio University, University of Cincinnati)

Topic can be submitted for public release

AFIT (only)

USAFA (only)

If you are submitting a topic for the USAFA, indicate if you are also interested in sponsoring a USAF Cadet in summer 2015 (Average cost for USAF Cadet for 33 days is \$5000)

Yes

No

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