1. **Research Title:** Acoustic Classification of Unmanned Aircraft Systems (UAS) Payloads
2. **Individual Sponsor:**

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

Electrical/Computer Engineering and Computer Science (BS or MS)

4. **Objectives:**
   - Design and execute a data collection using COTS acoustic sensors involving a real UAS system in a maneuvering pattern with various payloads.
   - Leverage traditional speech processing algorithms (i.e. pitch extraction, zero crossing rate, Mel Frequency Cepstral Coefficients (MFCC), etc.) to perform classification.
   - Validate algorithm against UAS flights in different maneuvers/flight patterns.

5. **Description:**

UAS or drones have become increasingly popular this past decade, due to its low cost and ability to be leveraged in a variety of applications such as videography, agriculture, cargo transport, surveying, journalism etc. The increased popularity of UAS requires new methods to monitor and regulate them in an efficient manner. One such method to regulate UAS is the ability to differentiate UAS with different payloads to ensure that they fall within Federal Aviation Administration (FAA) regularizations. This has been previously shown to work against a hovering UAS [1], the work proposed here is to extend the algorithms and evaluate performance against a maneuvering UAS.

6. **Research Classification/Restrictions:** Unclassified
7. **Eligible Research Institutions:** Any
8. **References:**

[1] Ibrahim, O. A., Sciancalepore, S., & Pietro, R. D. (2020). Noise2Weight: On Detecting Payload Weight from Drones Acoustic Emissions. Noise2Weight: On Detecting Payload Weight from Drones Acoustic Emissions.

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