

# Draper Hypersonics Research Interests

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## Introduction

Over the past 15+ years, Draper's efforts have supported the nation's reinvigorated interest in hypersonic technologies and systems. Initially our efforts focused on Navigation, Guidance and Control technology but have since broadened to benefit from the full breadth of the Laboratory's expertise, to include: hypersonic vehicle technology, hypersonic propulsion technology and Command and Control capabilities to manage the employment of hypersonic capabilities.

### *About Draper Laboratory ([www.draper.com](http://www.draper.com))*

*Draper is an independent, not-for-profit corporation, chartered to work on problems in the national interest. Draper is **seeking collaborative research partners from universities** to further the state of the art in key technologies of mutual interest. Research Whitepapers describing Draper's technology interests and Technical Points of Contact can be found on the Draper Scholars webpage ([Draper Scholar Program | Draper](#)). The Draper Scholars Program funds thesis-bearing MS and PhD students at partner universities as one of the effective ways to progress the technology. Other means of collaborative research (e.g. joint proposals, sabbaticals, etc.) are also encouraged. Please contact [education@draper.com](mailto:education@draper.com) if you have further questions.*

## Research Interests

1. Draper's Hypersonic Vehicle Technology interests are pictorially shown in Figure 1 below.

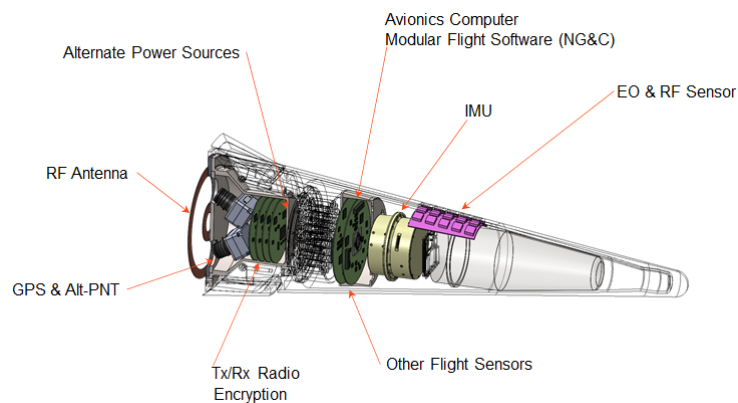


Figure 1: Draper Hypersonic Vehicle Technology Interests

- a. EO & RF Sensor: Sensors that can be used to localize potential targets. Sensor includes targeting algorithms
- b. Tx/RX Radio: Transmit and receive radio that can receive and send friendly messages or waveforms and/or be used for electronic warfare purposes

- c. RF Antennas: RF antennas to enable receipt or transmission of RF signals. Omnidirectional, beam nulling and/or beam steering with applicable clutter and noise rejection technologies
- d. Alternate Power Sources: Safe, high power density sources

2. Draper’s Hypersonic Propulsion Technology interests are pictorially shown in Figure 2 below.

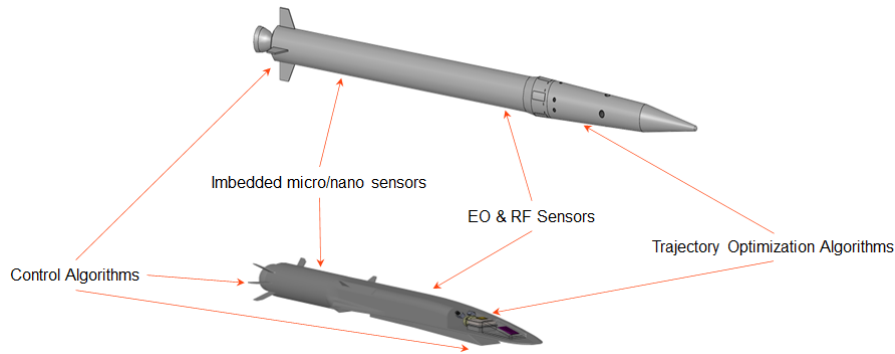


Figure 2: Draper Hypersonic Propulsion Technology Interests

- a. Control Algorithms: Guidance and control algorithms that enable hypersonic propulsion flight while minimizing resulting stresses on the airframe and/or minimizing propulsion energy losses
- b. Imbedded micro/nano sensors: sensors imbedded in the structure and/or propellant to enable better understanding of the systems aging and potential resulting degradation

3. Draper’s Hypersonic Command and Control Technology interests are pictorially shown in Figure 3 below.



- Detection & Tracking Algorithms
- C2 DecisionAids
- Cyber Protections & Assessments
- Supply Chain Assessments
- EO & RF Communication
- Encryption

Figure 3: Draper Hypersonic Command and Control Technology Interests

- a. Detection and Tracking Algorithms: Algorithms that enable detection and tracking of high speed flight vehicles using current and future sensors and sensor modalities, data processing techniques (including AI/ML)
- b. C2 Decision Aids: Decision aid technologies that enable processing of detection, tracking and targeting signals, target typing and data assimilation such that human leadership can quickly absorb incoming information and quickly make actionable plans and courses of action. This includes hardware and software, display approaches, display set ups, data aggregation techniques, automated information processing, etc.