

Hypersonic Technologies

- Maneuvering Hypersonic
- IRS/Sensor on HV
- Swarming M&S
- Glide Body M&S/T&I
- GPS Denied
- Land/Underwater Launch

Hypersonic GNC, GPS Denied and Autopilot M&S/Prototyping

- Hypersonic Vehicles (HV) GN&C M&S/I&T: Adaptive Guidance and Control for Hypersonic Vehicles
- Multiple Model Control Mixing for Performance Enhancement of Hypersonic Vehicles (e.g. Adaptive controllers to maintain HV performance within a region subject to aerodynamic knowledge uncertainties in both directions.)
- Hypersonic Weapons & Precision: Guided Munitions Design and Development (e.g., High Explosive Guidance Mortar & Munitions)
- Development of INS simulation software fusing data from various aiding sources in a GPS-denied (A2/AD) environments. Those include star trackers based aiding, altimeter aiding, and terrain based aiding; to name a few
- HV Aerodynamic/Engine/Airframe Data analysis to capture critical dynamic transitions : Stage 1 to Mid-Course to Terminal Phase with appropriate sensing and actuating design
- Development of applied/robust and adaptive guidance and control algorithms to 6-DOF hypersonic vehicle simulation in preparation for HWIL demos; implementation of guidance laws
- Employ Matlab/Simulink Model Based Design (MBD) for rapid GNC FSW prototyping using embedded coder and Matlab/Simulink coders

Propulsion/Launch

- Launch vehicle preliminary design, sizing, and trajectory analysis: support to experimental design/build/test program for a rocket technology demonstrator and its associated test facility
- R&D/Development of hypersonic airbreathing propulsion analysis, modeling and test: liquid rocket engine testing, analysis, design