



Aerospace Engineering Disciplines

> Guidance, Navigation & Control

Autonomous Rendezvous & Docking
Computational Fluid Dynamics
Thermal Modeling and Analysis
Structural Analysis and Mechanical Simulation
Space Systems Engineering
Payload Integration and Integration Support
Launch and Space Operations Planning

Guidance, Navigation & Control Competencies

GN&C Algorithm Design, Analysis, and Simulation
3DOF / 6DOF Trajectory Analysis (POST / Maveric-II)
Custom 6DOF Vehicle Simulations (Matlab/Simulink, C/C++, Java)
Sensor Fusion / Kalman Filtering
Neural-Net Based Adaptive Control
6DOF Hardware-in-the-Loop (HWIL) Simulation
Control-Structure Interaction
GN&C Requirements Development
High-Fidelity Visualization / Animation

About bd Systems

bd Systems is a woman-owned small business that provides engineering and information technology services for government and private industry. Based in Torrance, California, bd Systems has over 20 operating locations nationwide.

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Guidance, Navigation & Control

bd Systems continues its strong presence in the development, simulation and testing of guidance navigation and control systems in support of national aerospace programs. With significant experience at the NASA Marshall Space Flight Center's state-of-the-art test facilities, bd is fully capable and qualified to support program guidance, navigation, controls, avionics software and flight control system activities, from concept development through integrated testing and flight operations.



Aircraft & Missile Avionics

- Flight Control System Designer and Software Developer for Commercial Reusable Spaceplane
- X-37 6DOF Simulation and Control Stability Analysis
- X-43 Avionics Hardware and Software Development
- Next Generation Adaptive Flight Control Systems for UAVs
- Integrated INS/GPS Error Simulations to Steer Hardware Selection



Spacecraft & Satellite Control Systems

- Gravity Probe B (GPB) Control System Design, Simulation, and Flight Support
- Conceptual design of Jupiter Icy Moons Orbiter Gimbal Control System
- Space Tether System Simulation and Development
- Exo-atmospheric Vehicle Control Using Control Allocation between Redundant Control Effectors
- Custom-developed Advanced Visualization Software for Simulation Results Presentation



Launch Vehicle Guidance, Navigation & Control

- Crew Launch Vehicle Preliminary Control System Design and Stability Analysis
- Ascent/descent GN&C algorithms for Reusable Spaceplane
- High-fidelity simulation and requirements for 2nd Generation Reusable Launch Vehicle Program
- Monte Carlo Simulations of Off-Nominal Conditions to determine Mission Success Probabilities
- Shuttle Return-to-Flight Imaging System Simulation and Assessment



Autonomous Systems

- Hardware-in-the-Loop Simulation and Testing of Docking and Berthing Mechanisms Supporting Astronaut Training
- Sensor Fusion using Nonlinear Filter Algorithms for Rendezvous / Formation Flying
- Supported Development of Embedded Software for Advanced Space Rendezvous Sensors