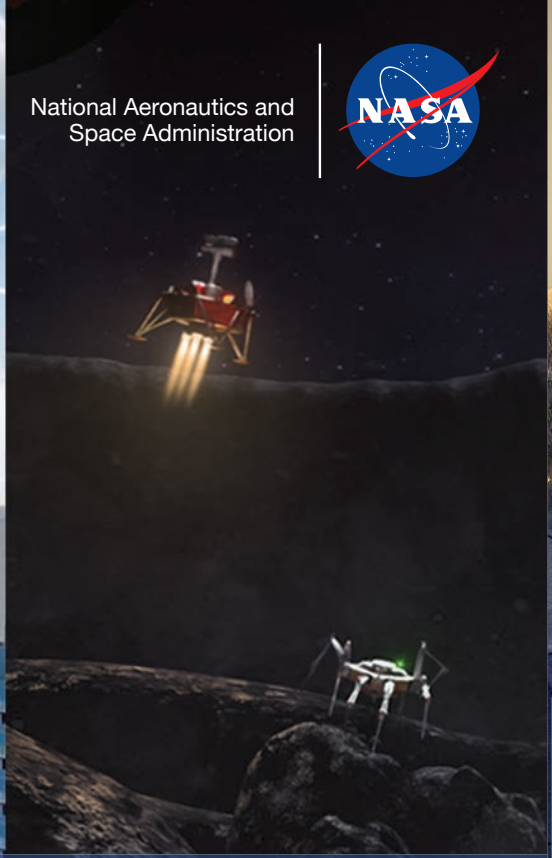


National Aeronautics and Space Administration



INTELLIGENT FLIGHT SYSTEMS

NASA's Langley Research Center

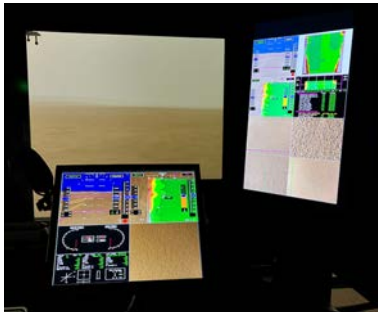


At NASA Langley, we transform space flight and aviation through adaptive and autonomous systems, human-machine teaming solutions, integrated flight systems, and new vehicle and operational concepts.



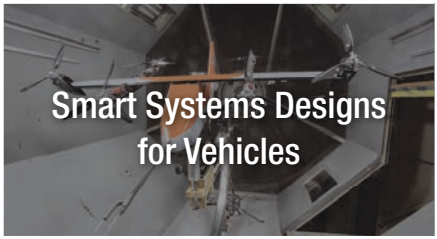
Langley researchers are driving innovation in path planning and detect-and-avoid systems. Langley's Detect and Avoid Alerting Logic for Unmanned Systems (DAIDALUS) serves as the foundation for the Navy's certified Ground Based Detect and Avoid (GUARDIAN) system, enabling safe operations between crewed and uncrewed aircraft. Langley's Traffic Aware Strategic Aircrew Requests (TASAR) system helps pilots find better flight paths by identifying route changes that avoid conflicts with other aircraft, weather, and restricted airspace. By enabling more efficient route adjustments, TASAR allows for shorter flight times and improved fuel efficiency.

NASA Langley Research Center advances human space exploration through cutting-edge simulation technology and aerospace engineering expertise. Our high-fidelity Lunar Flight Deck simulator accurately recreates lunar and Mars environments with complex lighting and dust visual effects, enabling comprehensive spacecraft handling qualities evaluation using human-in-the-loop testing with astronauts. Supporting NASA's Moon to Mars mission and the Artemis campaign's Human Landing System program, we develop innovative solutions like display augmentation and hover cue technology that significantly improve pilot control precision and safety. Our systematic evaluations provide data-driven insights reducing development costs while enhancing operational efficiency for safer, more cost-effective planetary landing capabilities.

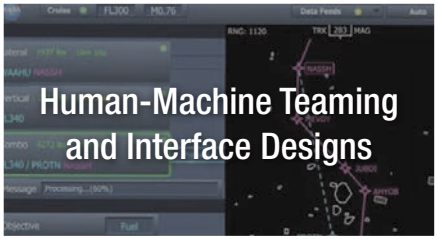


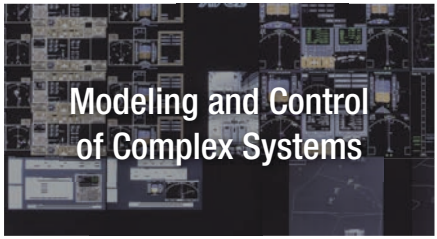


As part of NASA's FireSense project, Langley engineers are developing new drone-based technology for localized forecasting to address challenges in wildland fire management. Outfitting drones with wind sensors provides agencies the ability to gather timely, localized data to help determine how weather will impact the direction and speed of a wildfire. Firecrews on the ground may need this information to make quick decisions about where to deploy firefighters and resources, draw fire lines, and protect nearby communities.


Smart Systems Designs
for Vehicles


Trusted Autonomy
Technologies


Human-Machine Teaming
and Interface Designs


Modeling and Control
of Complex Systems


High Confidence
Safety-Critical Systems


Intelligent Sensory
Systems


Flight Dynamics and
Control Technologies


Ground and Flight Testing
of New Vehicles and
Technologies

Langley's state-of-the-art labs and facilities allow NASA, other government agencies, and private industry partners to develop and test the next breakthroughs in air and space.

- Flight Dynamics Research Facility (FDRF)
- Air Traffic Operations Lab (ATOL)
- Autonomy Lab for Intelligent Flight Technology (A-LIFT)
- In-Space Servicing, Assembly, and Manufacturing (ISAM) Lab
- Experimental Test Range (ETR)
- Wireless Intelligent Sensing Electromagnetic Environmental Effects Research Lab (WISE3R)
- Aerospace Controls Research Lab (ACRL)
- System Assurance Technology Laboratory for Learning-Based and Integrated Software
- NASA-FAA Laboratory Integrated Test Environment (NFLITE)
- Remote Operations for Autonomous Missions UAS Operations Center (ROAM)
- Mission Operations & Autonomous Integration Center (MOSAIC)
- Uninhabited Aircraft Systems (UAS) Integration and Validation Laboratory (SIVL)
- City Environment Range Testing for Autonomous Integrated Navigation (CERTAIN)







PARTNER WITH US

NASA Langley builds partnerships with industry, academia, and other government agencies to solve the world's toughest technical problems.

NASA's Front Door is your way in.

Connecting strategic partners with NASA Langley's expertise and world-class facilities moves ideas from concept to reality.

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