

UAV CRAFT

R&D ENVIRONMENT

UAV CRAFT is a groundbreaking unmanned aerial vehicle (UAV) simulation and sensor platform. Launched in 2015, UAV CRAFT is a high-performance, high-fidelity simulator that gives customers full control of the aircraft model (avionics, aerodynamics, weight and balance, engines, flight control, navigation, etc.), payloads (EO/IR camera, Radar, LiDAR, etc.), environments (scenarios/vignettes, weather, communications, etc.), and much more.

This unparalleled flexibility means that UAV CRAFT can easily be configured for new product development and design, GCS human factor studies, Urban Traffic Mobility, slung load transportation, or testing avoidance systems in BVLOS flight.

UAV CRAFT give users total control over a wide range of UAV types, all technical and tactical environments, and provides the freedom needed to customize a platform to achieve your research and development goals.

The Power of Simulation

Simulation allows users to discover problems before taking flight, thereby reducing the amount of flight tests needed. Traditionally, when conceiving, designing, or testing a very precise or complex part, component, or subsystem, researchers and designers are often concerned about keeping overhead low and preserving margins. By using simulated environments – such as those offered in UAV CRAFT – users can greatly mitigate their risk by testing, validating, and re-testing components on a wide variety of virtual platforms in real-time.

Testing virtual sensors on virtual UAVs in a virtual world, for example, is becoming increasingly beneficial to the aeronautic industry. NGC Aerospace, a Canadian aerospace company, recently developed a collision avoidance subsystem for a commercial drone and found simulation to be invaluable.

Many companies traditionally use their own solutions to test systems, subsystems and components. Often, manufacturers will solicit simulation solutions to test a design or product after it has been produced. But by this time, it might be already too late if the product has a deficiency or flaw. Simulation testing using robust applications – such as UAV CRAFT – can support a V-cycle development model in order for R&D

UAV CRAFT R&D Applications

- Sensor Development (IR, LiDAR, NVG, Radar)
- Flight Control Laws
- Human Factor Research
- Avoidance systems (security)
- BVLOS development
- Risk mitigation
- Tactical capabilities
- Testing in a controlled environment



departments to create and simulate realistic, synthetic environments in real-time before manufacturing has begun. Modular and adaptable tools and solutions can also be used for hardware-in-the-loop (HWIL) simulations and provide a platform with complex environments, realistic scenarios, and precise sensor controls.

Finally, an additional benefit of simulation is its environmental impact. By reducing the amount of flight tests, users can save energy (gas, batteries), eliminate pollution (air, noise), and ensure safety by reducing risk through simulated testing.

“Testing on an actual aircraft means thousands of dollars. You can save a significant amount of time and money by simulating,”

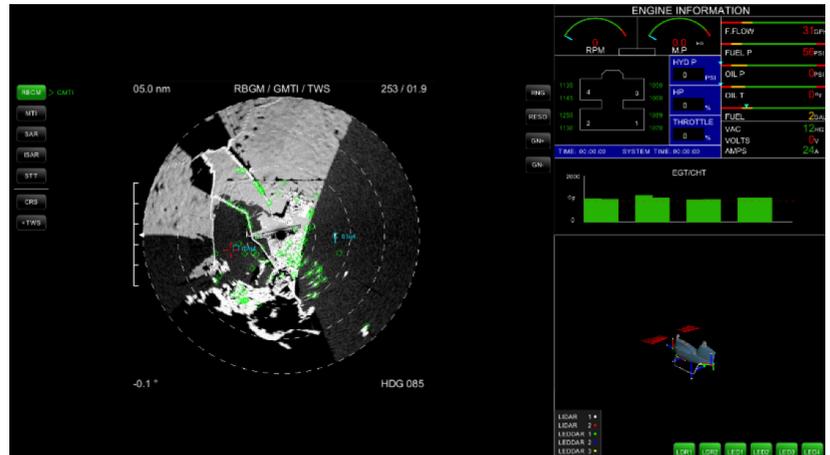
- David Neveu, Project Manager at NGC Aerospace.

Repeatability

The most important advantage of simulation in R&D can be summed up in one word: repeatability.

Testing is all about trial and error. Comparing Test A with Test B, then against Test C, then Test D and so on, all the while keeping the exact same context in place. In a live test, it would be impossible to conduct 10 tests under the exact same conditions – let alone 100. In simulation testing, the test could be repeated 5000 times, each test under the exact same conditions (quality-controlled environment) as the previous one. This consistency not only allows users to make accurate comparisons, but also allows researchers and developers to improve their product/system/algorithm through repeated execution under identical conditions. They are able to change or swap software or hardware, then run the exact same test again and again until they obtain the desired results.

At that point, they can begin introducing noise and other variables in order to test the robustness of their components or systems. For example, how does it perform at night? In the rain? Under high winds? Or perhaps all of the above? Finally, not only is this repeatability easy to accomplish in a simulation, but the cost of repeating a test does not entail any additional expenses.



“UAV CRAFT helped us adjust the UAV’s control laws before taking the drone to the skies. By doing it on UAV CRAFT first, we are able to stabilize the vehicle and have the right behavior and proper controls, thus reducing the amount of time it takes us to make changes on the actual vehicle”

-Enrick Laflamme, co-founder of Laflamme Aero, builder of the LX300 UAV.

Presagis Products

Our products are designed to build upon what users have already created. Rather than replace or recreate, Presagis applications enrich existing environments.

Every Presagis product is physically based and has been designed with quality of integration in mind. Because our company’s strength is software APIs, all of our products are modular, extendable, and capable of plug-and-play with a system. Our products are also very adaptable to the other products our customers are already using. The ability to integrate Presagis products with other research and prototyping solutions can not only reduce risk, but decrease time to market by providing virtual, simulated environments for real-time component testing.

Because development is performed within a rich, documented API, Presagis can supply proven and reliable training and services to assist users as their needs and staffing shift.

UAV CRAFT solutions go one step further and combine all of our tools into a fully-configurable simulator platform that can be quickly and easily adapted to a user’s product, system, or sub-system. From sensor products and avionics, to validation and human factor development, the CRAFT solutions are already being used for research, design, and testing all across the world.

UAV CRAFT is an indispensable research, development, and testing tool that can help users go through countless virtual tests, iterations and designs in order to arrive at an extremely performant, reliable UAV (or component or subsystem) that will benefit of years of service.