



High-fidelity  
simulation and  
modeling

**CGI**

# Achieving mission success with satellite simulators

We assure the success of space missions through a range of simulators that model satellite subsystems, ground stations, orbits and the environment to support mission operations, preparation, validation and training. We bring these tools together in comprehensive operational simulators that model all aspects of the spacecraft mission.

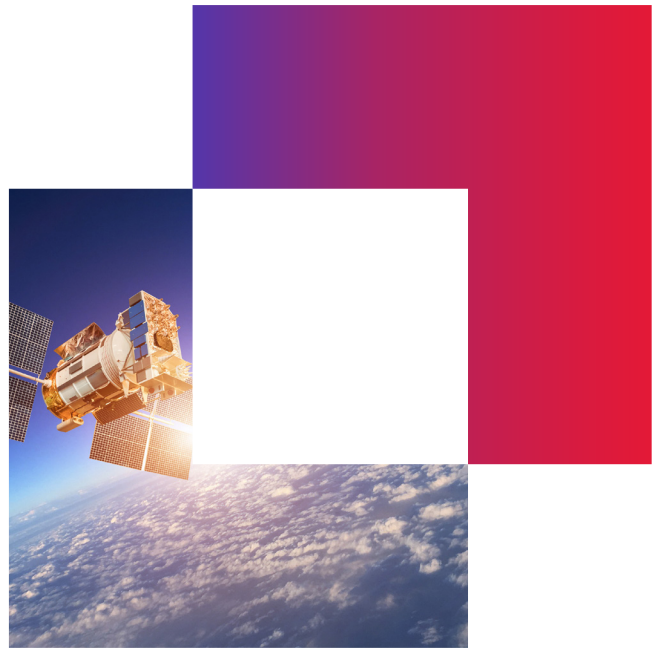
CGI helped develop the EAGLE-SETM software, which includes tools and blocks for modeling and simulating spacecraft entry descent and landing systems in the Mars, moon and Earth environments.

# CGI has been involved in developing sophisticated models for:

- Entry descent and landing
- Interferometer constellation deployment and control
- Lunar lander
- Mars planetary ascent vehicle

## **Key benefits**

- Develop and test flight code months or years in advance
- Multiply your productivity by using multiple setups under one license rather than depending solely on one configuration
- Get full control, reproducibility and inspection ability to optimize debugging
- Simplify integration with the final satellite platform build



## Fine-tuning and optimizing performance

We have developed our expertise and products over the decades and deliver high-fidelity simulators that emulate every component and subsystem. Will your mission algorithms cope with every scenario and customer demand? Will you perform your mission as efficiently and cost-effectively as possible?

Our simulators can incorporate any GNC, payload or service-providing/enabling algorithm as software-in-the-loop, so you know exactly how it will perform before launch. You can access every parameter and detail of your mission system, inject unexpected failures and put your mission software to the test.



## Digital Twin

Mission operations are made harder if you cannot visualize the situation surrounding your satellites in orbit. But you can simplify your situational awareness using your own eyes.

We deliver simulators that faithfully reproduce your satellites' behavior in a digital 3D environment—digital twinning. This allows your operations team to interpret your spacecraft telemetry and mission status in the most contextualized and humanly intuitive fashion.

# Preparing your team for the challenge

Readiness is the key to operational success. Make sure that the first time you encounter any failure or other anomaly happens in a safe and controlled environment. Your team will never be surprised and, even before launch, will have all the experience and knowledge of your satellites they need to tackle any problem.

CGI has extensive experience creating simulated environments perfect for guaranteeing operational team preparedness:

- **Perfect simulation of satellite behavior:** By modeling all spacecraft subsystems and running them with the actual flight software, we create an accurate simulation of environmental, physical and mission elements indistinguishable from the real thing.
- **Failure injection on any subsystem and mission stage:** Full control of all parameters of every subsystem and mission element allows operators to be placed in the middle of any recovery scenario imaginable, ensuring their readiness through experience in a safe environment.
- **Procedure verification, validation and familiarization:** Full replication of satellite and mission systems behavior makes the simulator the perfect tool to test and validate all operational procedures in any set of circumstances and offer a realistic environment for all operators to become acquainted with every procedure and possible scenario.



We deliver high-fidelity, complex simulators that put your mission control and automation algorithms through the most rigorous campaigns of tests and demonstrations to help you prove both your ability and their safety. With accurate and flexible space simulations, any licensing regulator's concerns can be cost-effectively addressed to help expedite your license's issue.



## About CGI

### Insights you can act on

Founded in 1976, CGI is among the largest IT and business consulting services firms in the world. We are insights-driven and outcomes-based to help accelerate returns on your investments. Across hundreds of locations worldwide, we provide comprehensive, scalable and sustainable IT and business consulting services that are informed globally and delivered locally.

For more information

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