

Ultra-Light Floating Platform: An Orbital Emulator for Space Applications

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<https://www.spacer.lu>, <https://www.youtube.com/@snt-spacer7718>

Crucial need for space mission emulation in an on-ground laboratory

- Space-related institutes need on-ground laboratories since space mission verification and validation experiments must be emulated in a laboratory before the launch.
- Floating platforms are cutting-edge solutions to emulate space missions by providing frictionless condition in 2D. Two floating platform can be seen in Zero-G Lab in Fig. 1.

SpaceR-SnT floating platform

- Made of ultra-light carbon-fiber material.
- Modular structure to emulate different scenarios satellites, active/passive debris removal systems.
- Can use both constant air supply and compact air bottles.
- Components of the floating platform are given in Fig. 2.

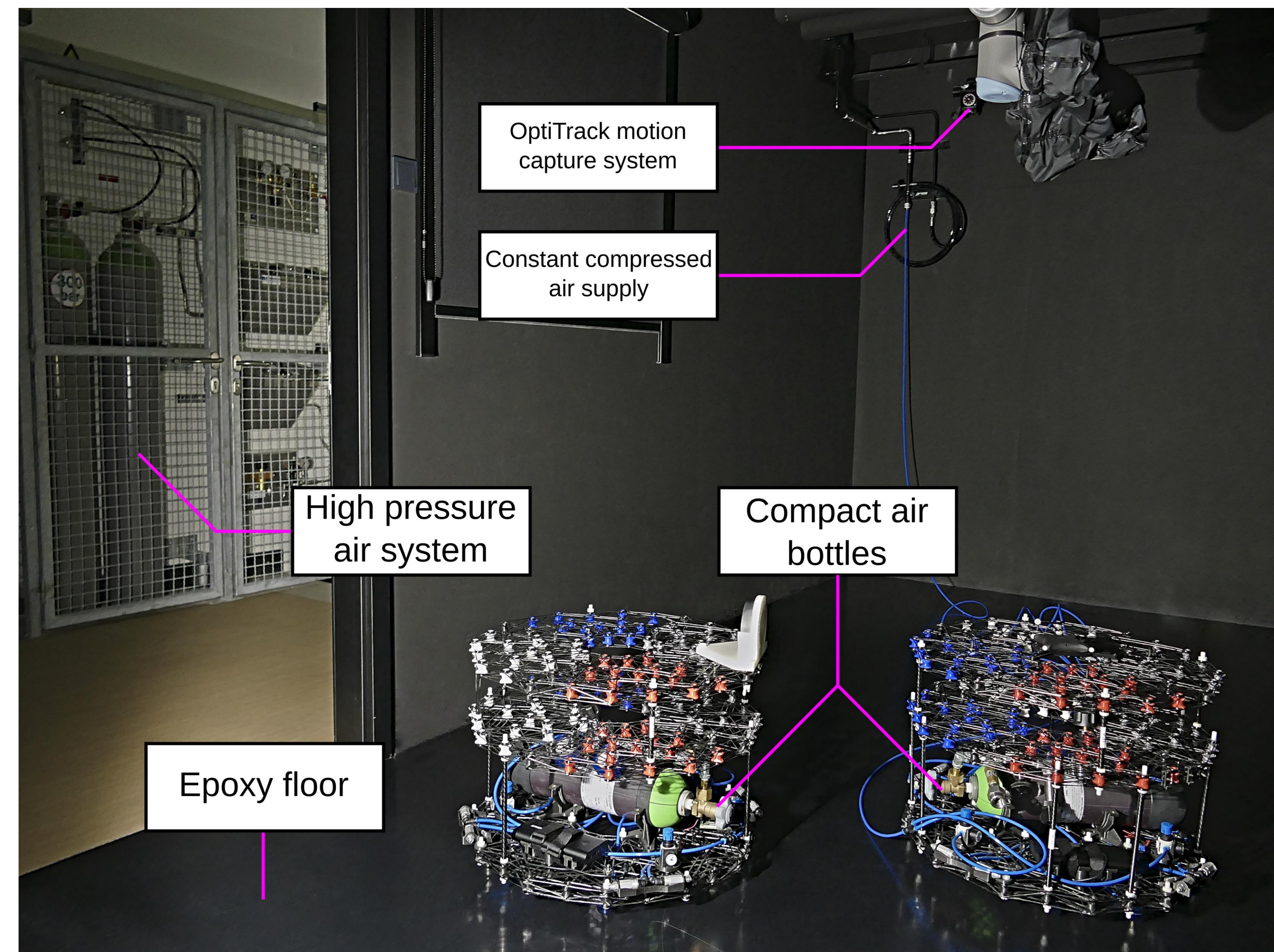


Fig. 1: Two floating platforms operating in Zero-G Lab.

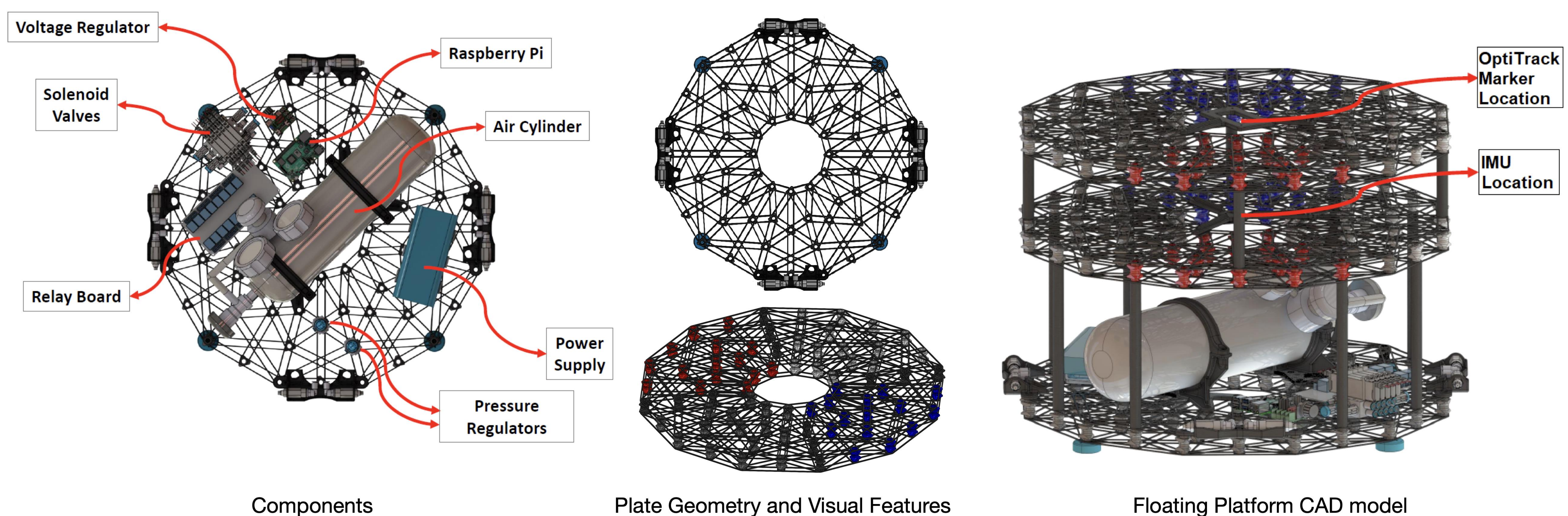


Fig. 2: The structure of the floating platform and its equipment.

Robotic Operating System (ROS) Framework

- ROS infrastructure to communicate with other sub-systems, such as OptiTrack, inside the Zero-G Lab.
- Gazebo Digital Twin model can be seen in Fig. 3.
- Videos regarding closed-loop control experiments of various scenarios can be seen from the QR code.

Videos

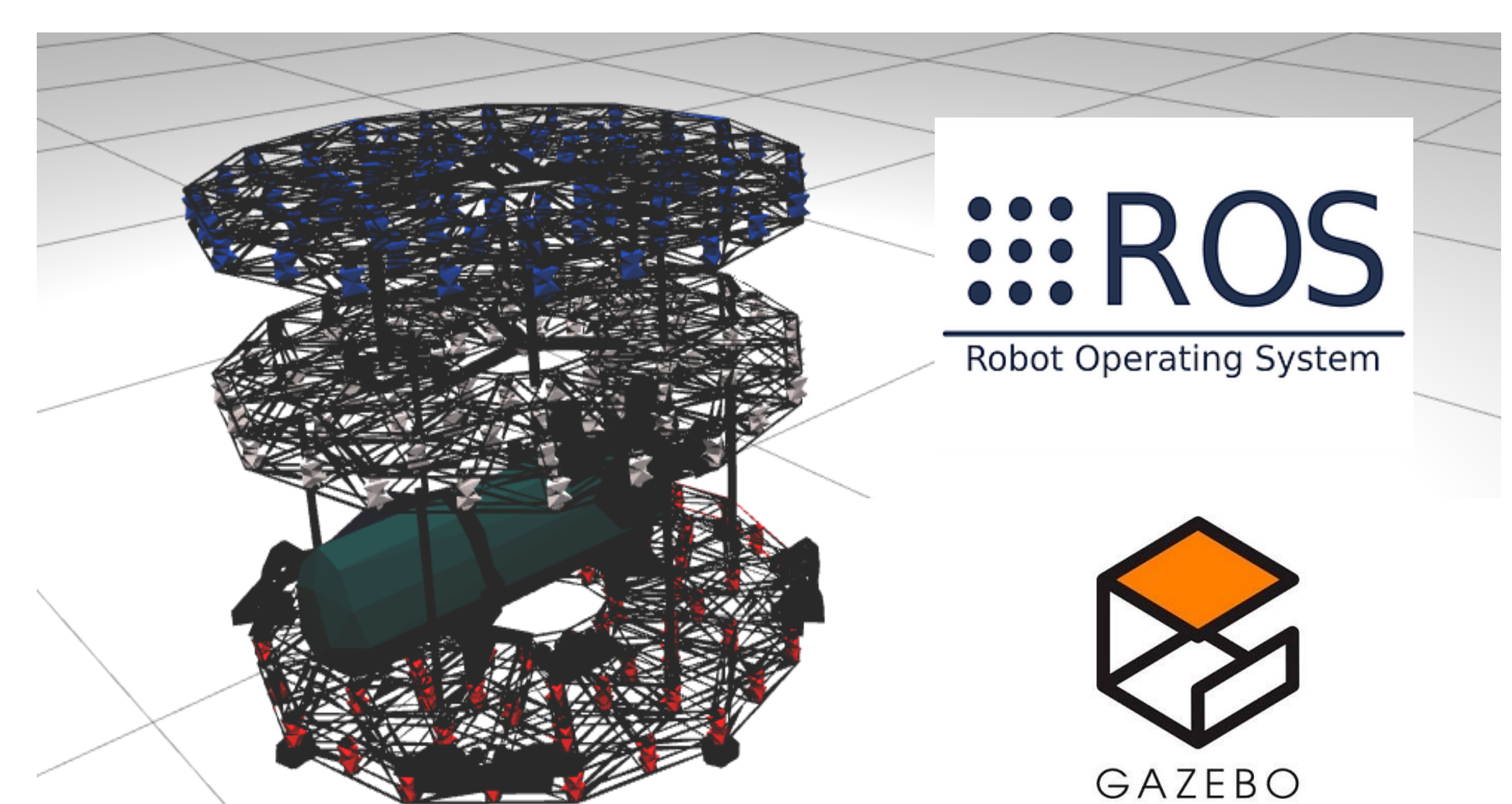


Fig. 3: Gazebo digital twin.