



GUARDIARIS
Train The Brain.



GUARD[®]
BY GUARDIARIS

GUARD[®]

MILITARY SIMULATION ENGINE

The pinnacle of military simulation and realism.

A large, modern military tank is shown on a paved road in a simulated environment. The tank is olive green with a long barrel and is positioned in the foreground. In the background, there are rolling green hills, some small buildings, and a blue sky with scattered white clouds. The overall scene is a high-quality digital rendering.

THE FUTURE OF MILITARY TRAINING

KEY FEATURES

- Fast terrain generation and editing using real-world terrain data
- Engine and Control Panel developed independently in the EU
- Intuitive UI with a wide range of tools catering to basic or advanced users
- Advanced analytics and reports with customizable KPIs
- Optimised for a wide range of devices and customizations
- Maximum data security and protection
- Fully destructible and interactive custom assets and environments
- Powerful simulation capabilities based on realistic physics
- Full day-night cycle and diverse weather conditions
- Complex behavioural trees for BLUFOR/OPFOR units and vehicles



GUARD® is Guardiari's advanced simulation engine, developed in-house specifically for military simulation purposes.

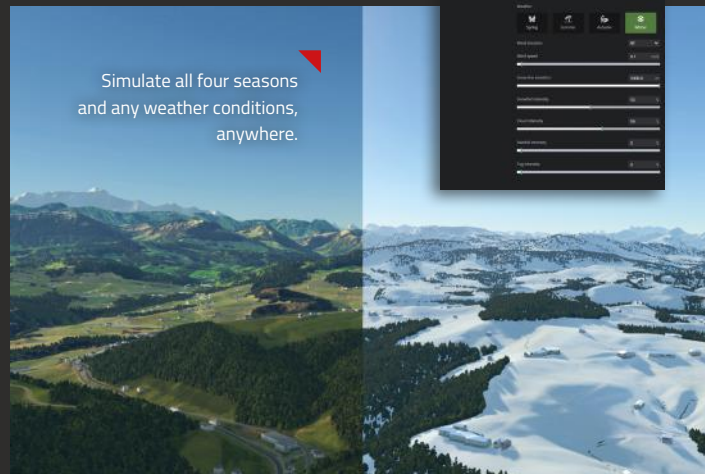
It was developed hand in hand with military experts, using constant feedback from active-duty personnel to tailor its features to the specific needs of militaries and the defence industry.



TERRAIN GENERATION FROM REAL-WORLD GEOGRAPHICAL DATA

GUARD® uses real terrain data provided by high-resolution satellite imagery, elevation models (DEM/DTM), and terrain vector data adhering to Open Geo Consortium standards to generate a geographically accurate, fully destructible, and interactive digital twin of Earth. It incorporates procedurally generated vegetation, buildings, assets, roads, and water bodies, using various materials and surface types for realistic planning, training, and simulation purposes.

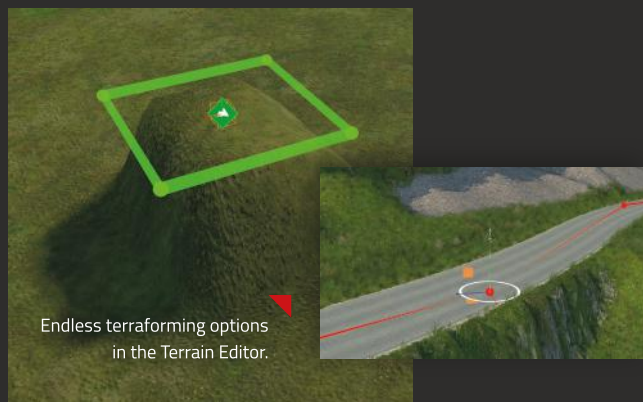
GUARD® fully simulates various surface types through complex soil dynamics, including dirt, gravel, mud, sand, and snow, among others.



TERRAIN EDITOR

The terrain generated by GUARD® can be manually altered in the **Terrain Editor** to reflect environmental changes, infrastructure updates, or the latest intelligence information. It allows the user to modify the terrain features, surface types, topography, place assets such as buildings, vegetation, vehicles, and landmarks (among others), and add or modify various types of roads. This enables rapid training environment creation using real-world or fictional terrains, supports mission rehearsal with up-to-date intelligence, and allows for testing in diverse environments.

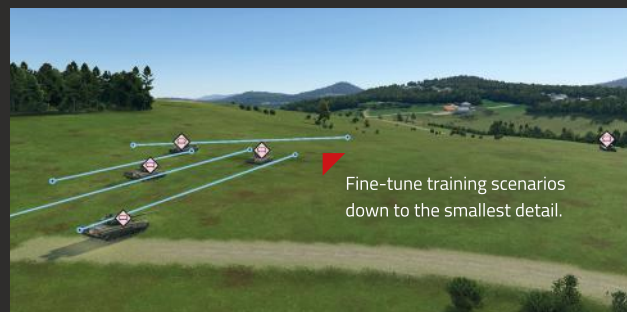
This flexibility enhances realism, speeds up training preparation, and ensures that exercises and simulations stay relevant to evolving operational or development requirements.



SCENARIO EDITOR

The GUARD® Scenario Editor allows end-users to create and modify training and simulation scenarios without coding, tailoring them to specific goals. The intuitive interface offers a variety of useful editing and creation tools for basic or advanced users, which enable quick and in-depth mission prototyping. It also supports the creation of thorough digital twin testing scenarios for the purpose of product development.

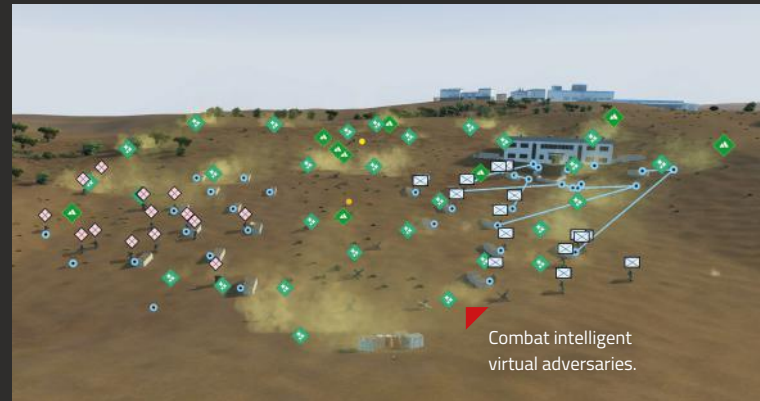
The Scenario Editor allows scenario designers to set interactions between assets, apply logic to enemy units, set time of day and weather conditions, control camera movements, event triggers, and other tools providing **unlimited scenario editing and creation capabilities**.





COMPUTER-GENERATED FORCES

Intuitive and comprehensive behaviour trees enable the simulation of intelligent, mission-driven actions by both friendly and enemy forces, **mirroring real operational patterns across a large pool of possible unit types** (infantry, vehicles, UAVs), and even according to various armies' military doctrines. The units react to trainee inputs, real-time environmental changes, sensor inputs, unit presence, etc., allowing for highly dynamic and unpredictable training scenarios.



EXACT PHYSICS SIMULATION

GUARD® incorporates a powerful and accurate physics model, enabling it to achieve unrivalled **vehicle driving dynamics, external and terminal ballistics, and full vulnerability models** across all in-engine assets. This complex yet effective system exactly calculates all asset interactions and behaviours, from spinning tires and armour thickness on a vehicle, terrain and surface properties, down to the smallest projectile fragment ricocheting from a wall or penetrating a metal plate, factoring in all types of materials and surfaces to create a comprehensive simulation environment. What's more, all this comes in a variety of Levels of Detail, ensuring performance stays stable on systems of all sizes and capabilities, conforming to each individual use case.

FULL VULNERABILITY MODEL

GUARD® has a full vulnerability model, accurately representing how assets respond to various force collisions. It replicates hit zones, subsystem damage, and progressive functional degradation, including mobility, weapons, and crew neutralization. Each asset consists of multiple parts, each with specific physical properties (material, thickness), reacting individually to impacts from projectiles, taking into consideration projectile type, velocity, and angle of impact. **Impacts are not only visually realistic — they behave in accordance with real-world physics.** The library of various assets and their components is constantly being updated and adjusted when new information is available.



EXTERNAL AND TERMINAL BALLISTICS

The vulnerability model is closely tied to how GUARD® handles ballistics. The engine considers the trajectory, velocity, and drop during flight, then determines the penetration, ricochet, or fragmentation when hitting the target, replicating real-life projectile behaviour.

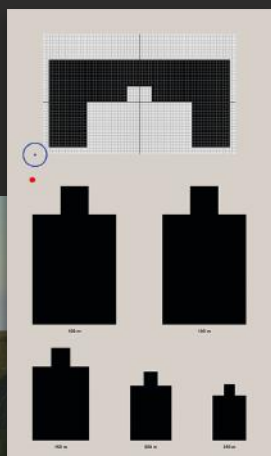


COMPREHENSIVE AFTER-ACTION REVIEW

GUARD® seamlessly integrates various sensors (biometrics, eye-tracking, weapon positioning, shot tracing, etc.) to enable the collection of extensive training and simulation data, which is processed within the AAR (After-Action Review) system to ensure rapid data capture, classification, and aggregation. **This supports comprehensive analytics on multiple levels of simulation.**

The AAR captures the state of the exercise during every moment, providing a full replay and breakdown of each scenario mid-action or after its completion. This gives the users the capability to instantly evaluate every decision, move, sensor input, shot, or any other aspect of training or simulation, resulting in immediate and constructive feedback or scenario adjustments.

Reports are generated automatically based on specific performance indicators (KPIs) relevant to user objectives, allowing for tailored evaluation aligned with real-world goals. They provide measurable insights into performance, sensor data, accuracy, and other relevant indicators set by the user. Reports and exercise data can be exported in custom formats for trend analysis and long-term performance monitoring.



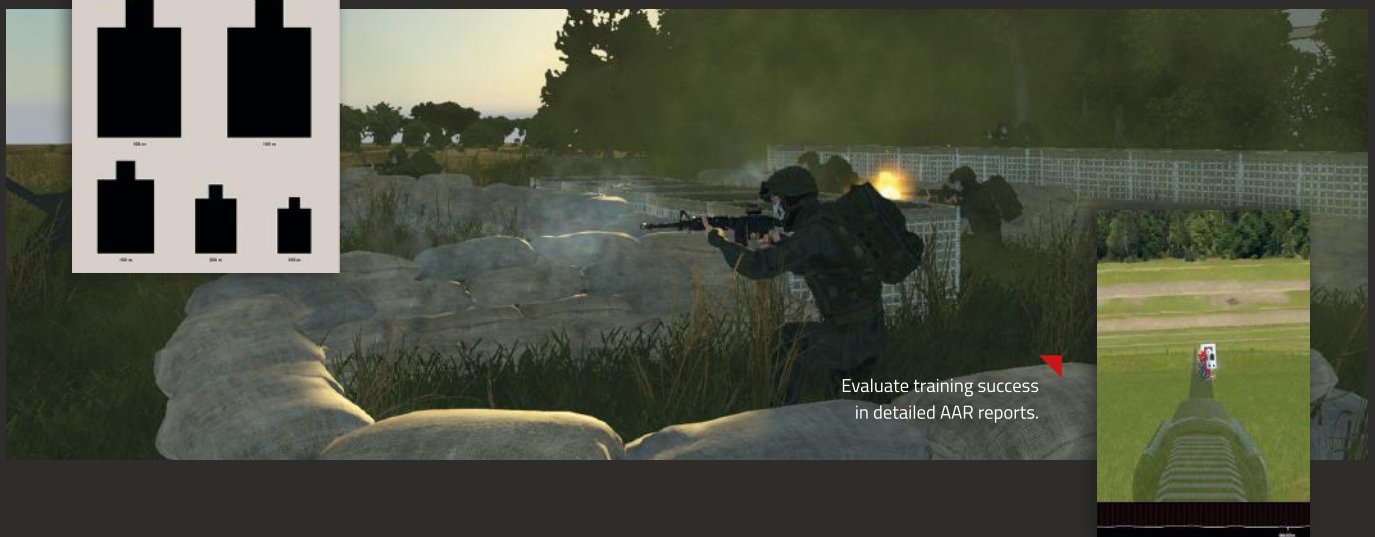
INTEROPERABILITY AND HLA

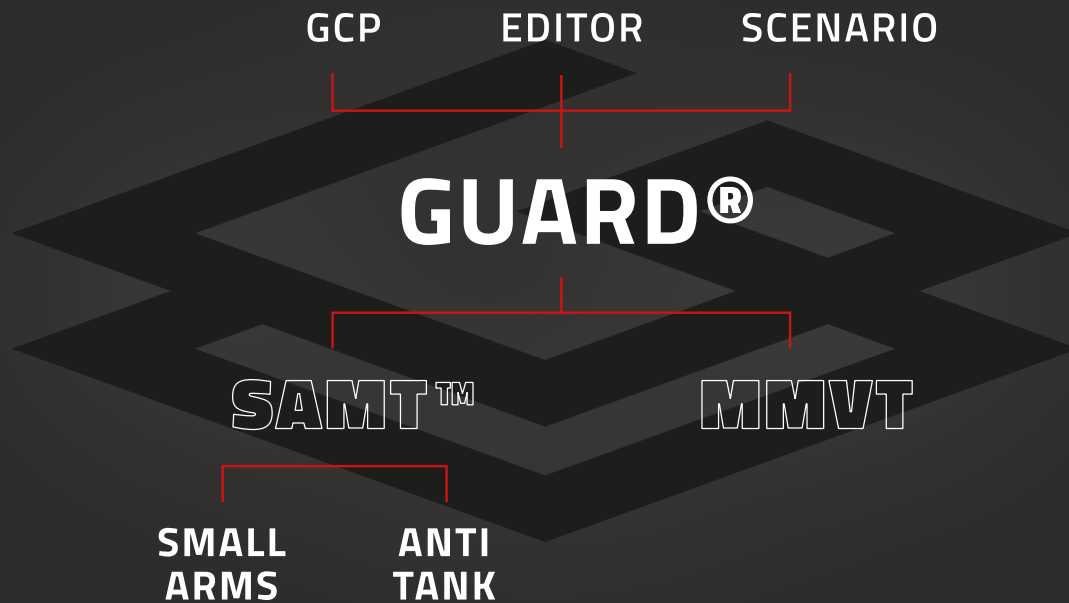
Guardiaris solutions offer complete and seamless interoperability powered by the GUARD® Simulation Engine. This enables the creation of large and complex simulator constellations, unlocking limitless possibilities for cross-platform communication. GUARD® supports HLA standards and enables connection with external systems upon end-user request.

SYNTHETIC DATA-SET GENERATION

GUARD® Simulation Engine can **generate massive synthetic data sets for use in AI model training**, addressing various challenges such as object recognition and tracking, targeting, and depth estimation, among others. Real images of vehicles, objects, environments, troops, and more (all digital twins) can be generated in an infinite variety of angles, poses, and perspectives, all fully processed with incorporated metadata. Additionally, users have full control over sensor data type, producing IR, Radar, LIDAR, and photo imagery with the click of a button.

The advanced digital twin capabilities within the engine extend to algorithm evaluation (navigation, swarm behaviour, etc.), UX/UI testing, and preliminary product development trials, shortening development cycles and reducing costs.





GET IN TOUCH

Contact us for detailed GUARD® technical specifications and customization possibilities.

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