



Simulate: Virtual Players and Computer Generated Forces

Whether you take first person control of an entity, or let the computer's AI manage the entire scenario, MAK's simulation products have you covered.

VR-Engage

VR-Engage lets you play the role of a first-person human character; a vehicle driver, gunner or commander; or the pilot of an airplane or helicopter. VR-Engage can be deployed as a trainee simulator, a role player station, an instructor aid, a desktop simulation game, or even as a VR headset experience.



Built on mature, proven technologies

VR-Engage gets its simulation engine from VR-Forces, and its game-quality 3D graphics from VR-Vantage.



VR-Engage is ready to use out-of-the-box

VR-Engage was built to be open and flexible. It can be customized and extended to meet program-specific requirements, and integrated into a diverse range of system configurations. Natively compliant with DIS & HLA, VR-Engage can be used in multi-player classroom environments, and can interoperate with existing simulation applications and 3rd party SAF/CGFs.

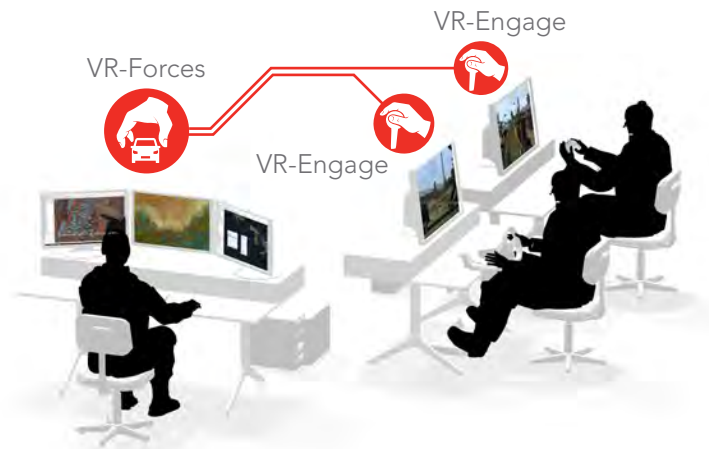
FEATURES

- HIGH-FIDELITY OWNERSHIP DYNAMICS FOR WHEELED AND TRACKED GROUND VEHICLES, AND FOR FIXED- AND ROTARY-WING AIRCRAFT (BASED ON THE VORTEX ENGINE FROM CM LABS AND FIXEDWINGLIB AND ROTORLIB FROM RT DYNAMICS)
- PLAYER CONTROLS USING MOUSE/KEYBOARD, GAME PAD, STEERING WHEEL/PEDALS, OR HOTAS DEVICES
- A LIBRARY OF DI-GUY HUMAN CHARACTERS FOR FIRST-PERSON-SHOOTER PLAY
- MULTIPLE WEAPON TYPES – INCLUDING GUNS, SMOKE GRENADES AND FLASH BANGS FOR HUMAN CHARACTERS; REMOTE WEAPONS ON VEHICLES; AND GPS-GUIDED OR LASER-GUIDED BOMBS, AND AIR-TO-AIR MISSILES ON AIRCRAFT
- INTEROPERABILITY WITH ALL VERSIONS OF DIS AND HLA - USING VR-LINK
- PUSH-TO-TALK RADIO AND INTERCOM VOICE COMMUNICATIONS VIA DIS/HLA
- COCKPIT INSTRUMENTS AND TOUCHSCREEN-CAPABLE MULTI-FUNCTION DISPLAYS FOR SENSORS, WEAPONS, AND COUNTERMEASURES - BASED ON GL STUDIO FROM DISTI
- SIMULATED DEVICES SUCH AS FLASHLIGHTS, BINOCULARS, NIGHT VISION GOGGLES, LASER RANGE FINDER, AND LASER TARGETING DEVICES
- MULTI-CREW-MEMBER CONFIGURATIONS WITH MULTIPLE VR-ENGAGE STATIONS PLAYING DIFFERENT ROLES ON THE SAME ENTITY
- EMBARKATION OF HUMAN CHARACTERS ON VEHICLES AND AIRCRAFT
- VARJO, OCULUS RIFT AND VIVE HMD AND HEAD TRACKING FOR A VIRTUAL REALITY EXPERIENCE
- 3D AUDIO – INCLUDING OWNERSHIP AND BATTLEFIELD SOUNDS
- TERRAIN AGILITY – INCLUDING SUPPORT FOR STATIC OPENFLIGHT AND PAGING/STREAMING TERRAINS

Additional benefits of using VR-Engage together with VR-Forces

VR-Engage can run standalone - without requiring any other MAK products, and is fully interoperable with 3rd party CGFs and other simulators through open standards. But many additional benefits apply when VR-Engage is used together with MAK's VR-Forces:

- Immediately share and reuse existing terrain, models, configurations, and other content across VR-Forces, VR-Vantage, and VR-Engage – with full correlation.
- Unified scenario authoring and management. Lay down and manage both VR-Forces CGF entities and VR-Engage player-controlled entities from a single common interface (VR-Forces GUI) - including unified scenario save/load, drag-and-drop, checkpointing, and rewind.
- Run-time switching between player-control and AI control of an entity, allowing a role player to take manual control of various VR-Forces entities throughout scenario execution.
- Play the role of a squad or team commander, while your subordinates are VR-Forces CGF entities, by triggering scenario events directly from VR-Engage.
- Launch a VR-Forces scenario directly from VR-Engage to support single player mode where the player chooses and joins a VR-Forces scenario.
- Dynamic terrain interactions, including opening doors and windows, destroying buildings, etc. – all correlated between VR-Forces, VR-Vantage, and VR-Engage.
- Shared weather and time-of-day control across VR-Forces and VR-Engage stations.




Extensibility and Customization


Although VR-Engage comes ready-to-run out of the box, its design is versatile, allowing system integrators to add modules and complementary products, and to customize and extend VR-Engage to meet program-specific requirements:

- VR-Vantage Remote Display engines provide a multi-channel display.
- SensorFX enhances the fidelity of EO/IR sensors using physically accurate modeling based on the material properties of terrain and objects.
- RadarFX Server generates SAR (Synthetic Aperture Radar) images upon request from an aircraft pilot, which are displayed in VR-Engage's multi-function displays.
- VR-TheWorld Server provides streaming terrain data (elevation, imagery, land use, and feature layers) through open standards.
- WebLVC Server enables web and mobile apps that can be used by exercise support staff to view, manage and stimulate VR-Engage entities (e.g. position entities, change weather, or initiate scenario events from a tablet).
- DiSTI's GL Studio editor can be used to author and edit interactive cockpit instruments.
- Editors from CM Labs and RT Dynamics allow you to author new vehicle types and change the dynamics of existing vehicle types.
- DI-Guy editors and SDK allow you to add new characters and motions.
- And perhaps most important – the VR-Engage system can be customized or extended by a C++ developer using the VR-Forces or VR-Vantage toolkits.




 VR-Engage
Example: Dedicated UAV Operator role-player



 VR-Engage
Example: Integrated into instructor's station for ad-hoc first person control



 VR-Engage
Example: Dedicated helicopter role-player

VR-Forces

VR-Forces is MAK's complete simulation solution – a powerful and flexible Computer Generated Forces (CGF) platform to fill your synthetic environments with urban, battlefield, maritime, and airspace activity. Whether you need a threat generator for training and mission rehearsal systems, a synthetic environment for experimentation, an engine to stimulate C4I systems, or an aggregate-level simulation model for high-level wargaming scenarios, VR-Forces is powerful enough to get your job done.

Powerful Simulation Engine

VR-Forces comes with simulation models for hundreds of battlefield units and systems. During scenario execution, VR-Forces vehicles and humans interact with the terrain, follow roads, move in convoys, avoid obstacles, communicate over simulated radios, detect and engage enemy forces, and calculate damage. Whether you're modeling at the entity or aggregate level, VR-Forces can stimulate your unit's behavior based on events such as sensor detection, the crossing of tactical phaselines, or entering an area of interest.

Simple Scenario Creation

VR-Forces provides an intuitive user interface that allows end-users to build scenarios by positioning forces, creating routes and waypoints, and making and assigning tasks or plans with a simple point and click. Lay down the basic outline on a 2D tactical map, then switch to 3D scenario editing mode to accurately position entities within a complex urban environment. Turn on the exaggerated reality mode to gain a big picture understanding of your scenario without losing your 3D view. Bring up a 3D inset view for any entity to see the world from its perspective. VR-Forces includes a wide variety of models to include in your scenario, including combat, sensor/detection, movement, weather, communications, and resource models.

Intuitive Model Editing Tools

Modelers can configure and set up the simulation environment with VR-Forces' intuitive GUI-based Simulation Object Editor. This allows you to edit or extend the set of simulation models available to VR-Forces. Vehicle dynamics, sensor capabilities, and damage models can be configured.

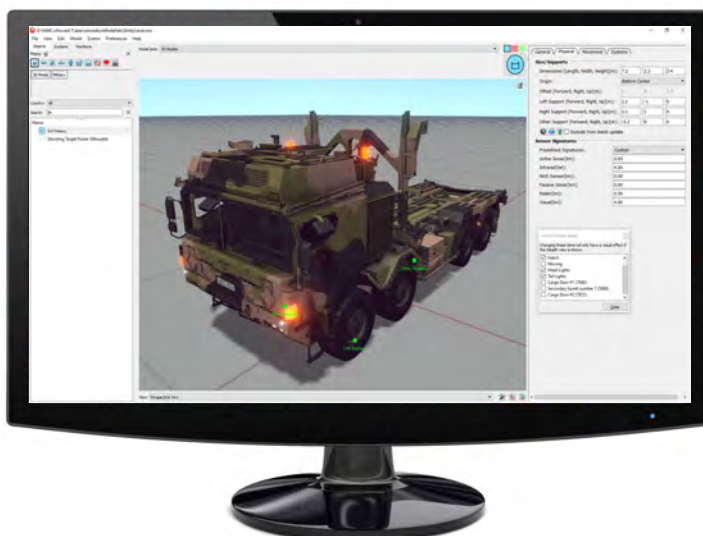


FEATURES

- SIMULATION MODELS FOR AIR, LAND, SEA, VEHICLES, MUNITIONS AND HUMAN CHARACTERS
- 2D / 3D INTERFACE FOR SCENARIO AUTHORING & RUN-TIME EDITS
- CORRELATED SIMULATION AND VISUALIZATION
- HLA AND DIS COMPLIANT
- TERRAIN AGILE, INCLUDING STREAMING TERRAIN
- PARAMETERIZED DYNAMICS, SENSORS AND DAMAGE MODELS
- GUI-BASED MODEL AND PARAMETER EDITORS
- BATCH MODE FOR ANALYSIS
- REAL-TIME AND NON-REAL-TIME OPERATION

USE CASES

- VIRTUAL TRAINING
- TACTICAL/COMMAND STAFF TRAINING
- CONCEPT EXPLORATION AND VALIDATION
- EXPERIMENTATION
- AIR TRAFFIC MANAGEMENT
- HUMAN BEHAVIOR STUDIES
- UAV AND UAV SENSOR SIMULATION





Aggregate-Level Simulation

VR-Forces' Aggregate-Level Simulation (constructive) model helps users develop Command Staff Training and high-level wargaming scenarios. Mobility, engagement, attrition, combat engineering, logistics, NBC (Nuclear, Chemical, and Biological), reporting, and more are all modeled based on high-level parameters associated with units such as companies, battalions, and brigades.

Extending and Customizing VR-Forces

VR-Forces' scripted tasks enable users with only basic programming skills to quickly develop complex tasks, easily coordinate group behaviors, and script GUI components in minutes.

For those developers who need to extend or customize VR-Forces or integrate VR-Forces functionality into custom applications, the VR-Forces Toolkit, a full C++ API, is available. Through this API, nearly every aspect of the VR-Forces simulation engine and GUI is customizable – add, replace, or modify the simulation engine's vehicle dynamics, behaviors and tactics, damage models, sensors, countermeasures, and weapons to suit the needs of your simulation. VR-Forces' Remote Control API allows you to control its simulation engine from remote applications.

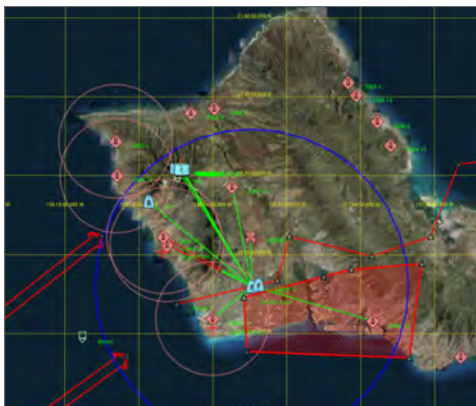
Distributed Architecture

VR-Forces features a fully distributed architecture. You can divide responsibilities among multiple simulation engines for greater scalability, or run multiple front-end GUIs for collaborative scenario generation or training.

Terrain Agility - MAK's Ability to Easily Load Your Terrain

VR-Forces is designed to simulate on and visualize terrain data from many different industry standard formats. VR-Forces can read terrain data stored locally, such as DTED, ESRI® shapefiles, stream over a network from terrain servers, such as MAK's VR-TheWorld Server, or use a combination of these approaches.

VR-Forces can simulate in any variety of regions, such as dense urban environments, including the interiors of multi-story buildings, or in scenarios that span the entire globe.



Simulate: Virtual Players and Computer Generated Forces