Bohemia Interactive ®
Interactive
S I M U L A T I O N S

TECHNOLOGY TO REVOLUTIONIZE TRAINING AND SIMULATION

Desktop Training | Simulation Host | Image Generation | Software Development Tools | Virtual Reality | Artificial Intelligence | Terrain Editing & Management

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BISim Offers Comprehensive, Cutting-Edge Technology

Our mission is to harness the explosive potential of technology to revolutionize training and simulation.

Who We Are

Founded in 2001, Bohemia Interactive Simulations (BISim) is a global software company at the forefront of simulation and training solutions for defense and civilian organizations. BISim uses the latest game-based technology and a 225+, in-house engineering team to develop high-fidelity, cost-effective training and simulation software products and components for defense applications. BISim's technology has been selected as the core simulation, visualization and terrain management software for the U.S. Army's 2025 and beyond simulation capability.

What We Offer

We offer a comprehensive, cutting-edge technology portfolio encompassing desktop training, simulation host, image generation, terrain editing and management, artificial intelligence and software development tools, all integrated to provide superior workflow. Our open and modular COTS software products can be customized by users or enhanced by our large technical team who has broad and deep expertise in developing training and simulation solutions for military and defense organizations worldwide.

Through our own investment in research & development and support from customer funding, we've been able to continuously drive significant functionality, usability and performance improvements across our product portfolio. And our software is easy to use, so you can get right down to training.

Who We Serve

Globally, many hundreds of thousands of military personnel are trained every year using VBS software products. More than 60 NATO and NATO-friendly countries and over 300 integrators/ prime contractors use VBS technology, many making significant funding commitments to extend VBS product capabilities alongside BISim's internal investment program.

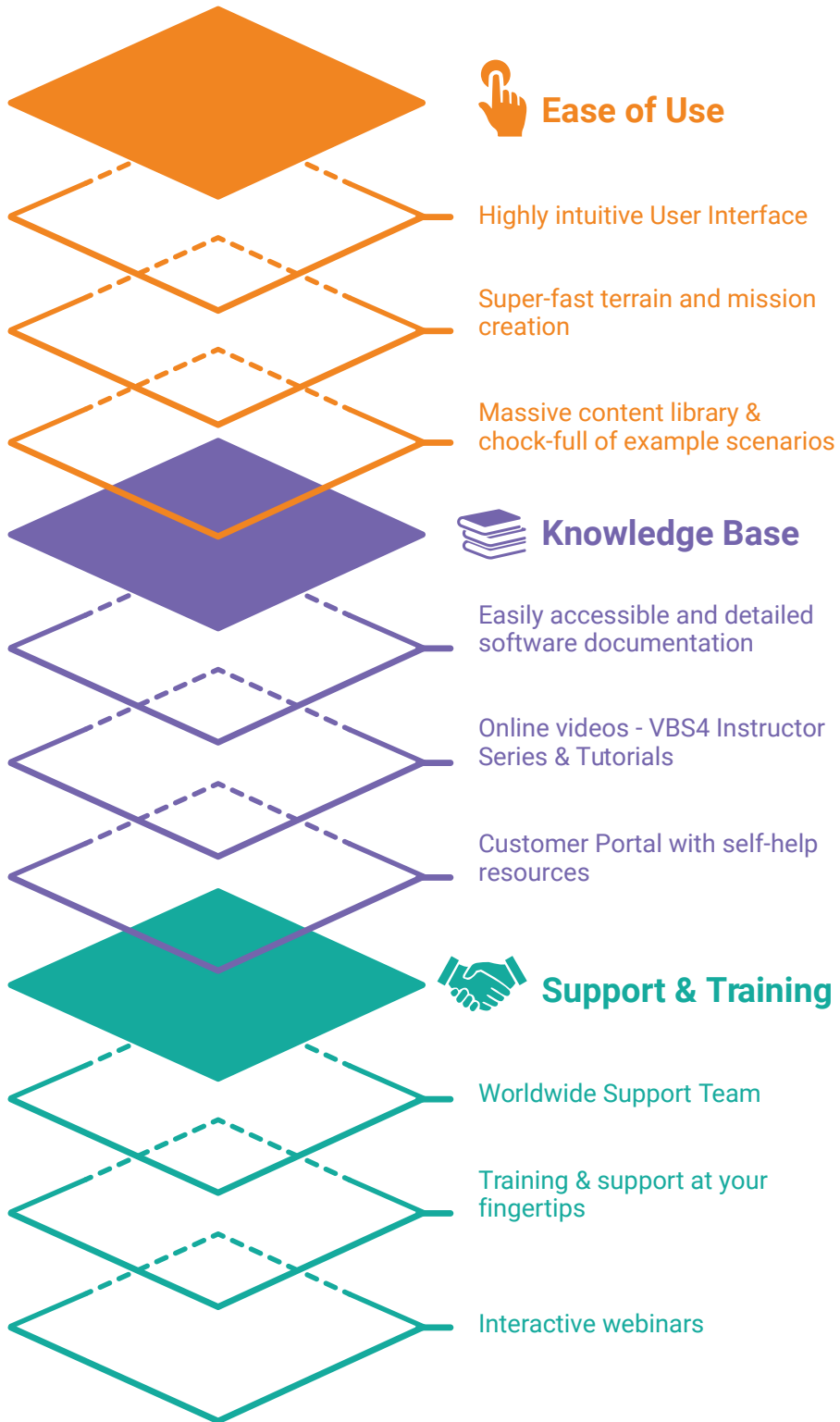## 2001
Bohemia Interactive Simulations founded in Australia

300+
Employees across offices in the U.S., UK, Czech Republic, and Australia

60+
Countries where BISim products are used to train personnel

The Complete User Experience

Ease of Use

Highly intuitive User Interface

Super-fast terrain and mission creation

Massive content library & chock-full of example scenarios

Knowledge Base

Easily accessible and detailed software documentation

Online videos - VBS4 Instructor Series & Tutorials

Customer Portal with self-help resources

Support & Training

Worldwide Support Team

Training & support at your fingertips

Interactive webinars

VBS4 - Easy-to-Use, Whole-Earth Virtual and Constructive Simulation

VBS4 is packed with capabilities to support large-scale, combined arms virtual scenarios and hundreds of authentic military training uses. Customers can have trust that VBS4 is fully featured and ready for training as it contains all the functionality of VBS3 and is already in use by a number of major militaries.

VBS4 is a whole-earth virtual and constructive desktop trainer and simulation host that allows you to create and run a vast range of military training scenarios anywhere on Earth.

It offers an industry-leading step change in modularity, openness and ease-of-use as well as the performance and terrain enhancing capability of BISim's new engine, VBS Blue.
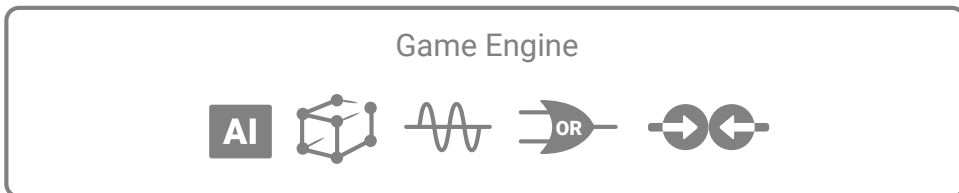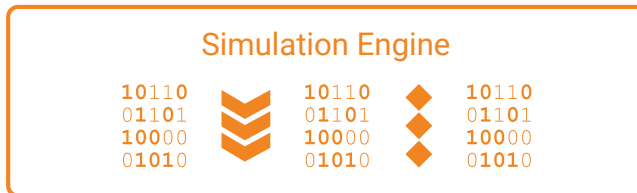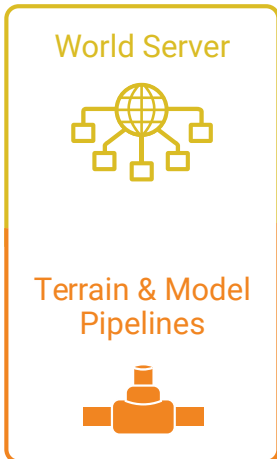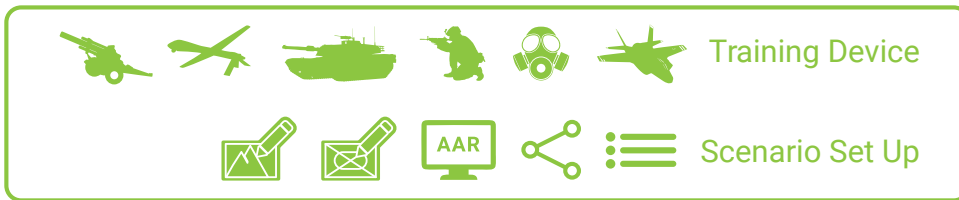
VBS4's new workflow and capabilities enable users to start training faster, make edits and updates to training scenarios and terrains with greater ease and collaboration, and simulate training scenarios anywhere on the virtual Earth.

Prepare-Execute-Assess Workflow

VBS4 is designed around a Prepare-Execute-Assess workflow. In VBS4, users create "Battlespaces" that are a collection of terrain edits, mission plans, scenario files and after-action reviews. Each Battlespace is centered on a specific location on the virtual Earth. Scenarios can be modified in real time and replayed in the After-Action Review for lessons learned. VBS4 scenarios can be fully constructive (AI controlled), fully virtual (human controlled) or a mix of both.

VBS4 - Much More Than a Game Engine

Training Device

Scenario Set Up

Simulation Scripting

World Server

Content

Terrain & Model Pipelines

Simulation Engine

Simulation SDK / AI editor

```
10110    10110    10110
01101    01101    01101
10000    10000    10000
01010    01010    01010
```

Low level APIs

Game Engine

AI   OR

Unlike many other game engine-based simulations, the VBS4 engine (VBS Blue) was developed specifically to serve the military simulation and training domain. VBS Blue offers millimeter accuracy and global scale simultaneously, and it has a flexible terrain ingestion pipeline capable of facilitating quick use of terrain data from any conceivable source.

VBS4 is an all-in-one application for military simulation and training. It has the VBS World Server that feeds terrain data from authoritative sources into VBS4, which has a simulation engine and computer-generated forces (VBS Control AI), comprehensive and well-tested interfaces for building training content (VBS Editor, VBS Plan, VBS Geo), and capability for soldiers to train and learn (VBS AAR).

If you license a game engine, you need to build out the rules of interactions in your 'virtual world' (what we call the Simulation Engine), and you need to build out all the assets that you want (vehicles, avatars, sounds, animations, special effects, terrain, buildings, roads and rivers, etc.). With VBS4, you get an already built-out virtual world (Sim Engine) and you get a gigantic library of assets (19,000+ models), all pre-configured to work with the simulation engine and all based on the myriad of major and minor changes and enhancements BISim has worked on over many years with our large customer base of military and industry users.

Learn more at vbs4.com
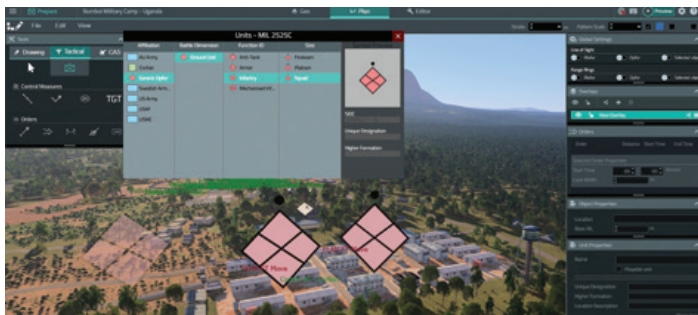
VBS4 Benefits

Train Anywhere on Earth
VBS4 includes whole-Earth data and supports training at any location on the virtual globe.

Generate and Edit Terrains Faster
VBS4 includes VBS Geo, a new intuitive WYSIWYG editor that allows users to import, create and modify terrain. The interface enables users without formal training to quickly and easily edit terrains.

Increase the Speed of Scenario Creation
VBS4 includes VBS Plan, a new mission planning capability allowing users to quickly draw tactical plans in 2D and 3D, and then execute those plans in VBS4 with high-fidelity AI.

Stream High-Fidelity Terrain Data
A powerful companion application included alongside VBS4, VBS World Server is a geospatial data server that centralizes terrain data for VBS4 and VBS Blue IG. It provides efficient networked access to high-fidelity terrain for the entire planet.

Reduce the Need for Human Operators
BISim aims to reduce human intervention in simulation exercises through its VBS Control deterministic and doctrinal AI that is fully integrated with VBS4 and the new mission planning component.

A Powerful Simulation Host
VBS4 can drive multiple IG channels as a high-fidelity simulation host to tap into the comprehensive simulation capabilities for simulator use.

A Massive Content Library
With 19,000+ accurate models of military and civilian vehicles, weapons and characters, VBS4 reduces deployment costs associated with deploying training solutions.

Does Everything VBS3 Does and More!
VBS4 includes all VBS3 capability and supports all VBS3 use cases.

VBS Blue IG - High-Performance, 3D Whole-Earth Image Generation

VBS Blue IG is BISim's whole-earth image generator software, which uses the CIGI standard to rapidly integrate with existing third-party host simulators and our own VBS4. VBS Blue IG is already in use on dozens of defense industry projects ranging from VR-based flight and air crew training to multichannel simulation for JTAC/FAC training and helicopter crew training.

VBS Blue IG provides day/dusk/night scenes across multiple synchronized displays to support the full spectrum of land, sea, air and space use cases. Supporting out-the-window, infrared, and night vision scenes, VBS Blue IG leverages video-game technologies to bring AAA game graphics to military simulation and training.

Features & Capabilities

- Industry's largest AAA game-quality asset library
- WGS-84 based worldwide terrain
- Whole earth terrain database
- Sensors including electro-optical, infrared and night vision
- Day/dusk/night & weather operations
- Synchronized multi-channel and viewport support
- AR/VR hardware support with greater than 90 hertz update rates
- Realistic view distances and scene densities
- Mission functions include collision detection, height above terrain, and laser range finding
- Dynamic lighting for handling hundreds of thousands of dynamic and static light sources for cities, runways and vehicles

VBS Blue IG Benefits

Comprehensive - With a massive model library and whole-earth database, VBS Blue IG provides a single image generation solution for the full spectrum of land, sea, air and space use cases.

Powerful - High-performance rendering engine optimized for the latest GPUs that supports realistic view distances and real-world scene densities.

Compatible - Supports CIGI compliant host computers and a wide variety of existing terrain data formats.

Flexible & Extensible - Featuring an open plug-in system for source data import, and an SDK for customization and integration, VBS Blue IG readily adapts to existing and future requirements.

Integrated - Deep integration and correlation with VBS4 as simulation hosts to support reuse of existing VBS4 content and scenarios.
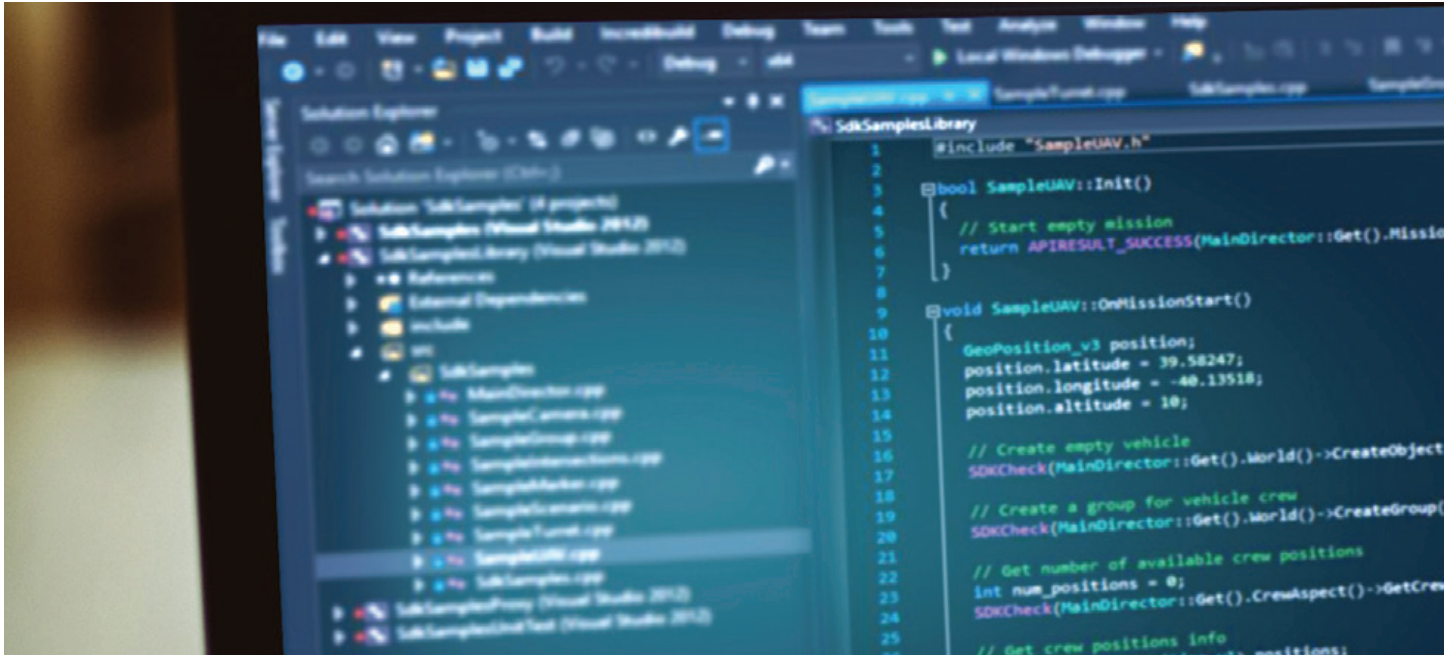
BISim SDKs - Bringing Openness and Modularity to VBS4 and VBS Blue IG

Using BISim SDKs, third-party developers and system integrators can leverage the same APIs and source code our internal team uses to create new capabilities in our products.

Our Tools Are Your Tools

At BISim, our software development kits are continuously utilized and proven by our own large, 225+ developer team when building and extending our products. We build our own products using the same APIs we license to third-party developers and integrators, giving them full control over customizing our products.

BISim offers VBS Simulation SDK for customizing VBS4 and VBS IG SDK for customizing VBS Blue IG.

Built for Openness & Modularity

BISim's SDKs are built on the company's Gears modular software development framework, which defines a standard way for components to communicate through well-defined standard interfaces. Challenged by a lack of formalized industry-wide standards for modular software development, BISim began developing its own set of open standards for simulation development. This framework uses a set of common APIs, which developers can use to write collaborative systems, that are modular by design, and less costly to develop and maintain as compared with other methods.

Simplify and Standardize Your Software Development Process

BISim offers a free version of Gears Studio Community Edition, available online at www.gears.studio. Gears Studio offers simple project configuration, dependency package management, source control integration, and assistance with the creation of APIs.

Gears Studio Pro, BISim's integrated development environment, is included with both the VBS Simulation SDK and VBS IG SDK. Gears Studio Pro makes it easier for multiple developers or even multiple companies to develop software components independently of each other while still working on a single product.
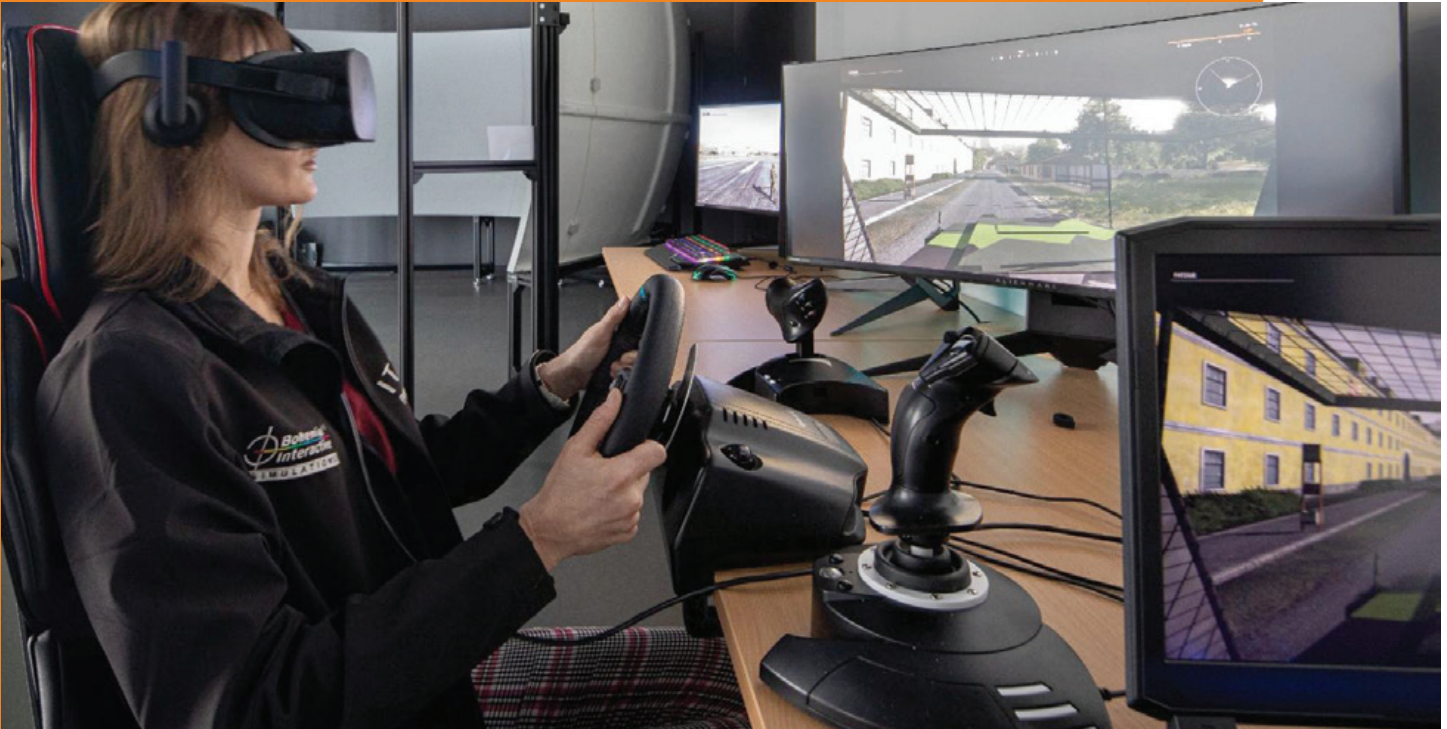
BISim XR Technology - A Platform for Building VR/MR/AR Solutions

BISim's technologies offer a powerful, cost-effective platform for development of emerging eXtended reality-based, part-task training solutions.

XR-based visual systems leveraging VBS Blue IG can be used to replace domes and other complex displays.

Benefits

Comprehensive - Supporting the latest XR devices and peripherals, VBS technologies provide the scene generation, model library, geo-specific terrain, artificial intelligence, scenario generation and after action review tools necessary to develop comprehensive simulation and training solutions.

Cost-Effective - Rapidly develop custom XR solutions using VBS technologies that provide the complete virtual environment out of the box. Save time and effort over the use of game engines that require separate development for terrain, models, sensors, and interfaces.

Information Assurance Ready - VBS technologies are used in DoD programs of record and have received authorizations to operate and certificates of networthiness — paving the way for required certifications.

Immersive - VBS-based XR solutions are optimized to support high-resolution HMDs and sophisticated interface technologies that create greater levels of immersion.

Standards-Based - VBS technologies support a variety of industry standards including CIGI, DIS/HLA, and Collada/CDB, enabling development of interoperable solutions.

Extensible - Add intelligent tutoring systems, support assessment capabilities, and integrate emerging devices via our SDKs and the power of the Gears architecture, a software development framework that provides open source interfaces to XR solutions.

VBS Control AI - Breakthrough AI Behaviors at Your Command

VBS Control is a new software technology designed to provide next-generation AI for VBS4 and other VBS-based products. The core of VBS Control is the VBS Control runtime library, freely available in VBS4.

VBS Control technology is currently used in VBS Control Editor (available with VBS Simulation SDK) and VBS Control Behavior Pack 1 (available as part of VBS4).

VBS Control Editor

VBS Control Editor provides full and direct control of the AI and is designed for creating behaviors for individual soldiers or vehicles, as well as behaviors for higher military echelons up to a company level. The simulation of these AI entities is provided by VBS4. Using the VBS Simulation SDK, developers can extend AI behavior capabilities and interact with external systems.

End users of VBS Control Editor can create highly complex AI behaviors using the industry-leading behavior tree technology and Lua scripting. The behavior creation process is based on combining primitive behaviors provided by the VBS Control runtime library (such as navigation, tactical analysis, cover usage or weapons handling) into a more complex decision-making process, such as a full military doctrine. Simulated entities can currently include infantry and ground vehicles, with the possibility of supporting other platform types in the future.

TerraTools - Rapid and Automated Creation of Correlated Terrains for Simulation

Supporting correlation across more than a dozen runtimes, TerraTools is the market leader in correlated terrain output. Develop and export a single terrain project to multiple runtime formats for correlated terrain in training exercises that connect different simulations.

What is TerraTools

TerraTools, the industry-leading terrain generation software from TerraSim (a BISim company), rapidly and automatically builds high-fidelity geo-specific terrain databases from a variety of cartographic input data, imagery, and 3D model content. The TerraTools project flow graph allows users to build, review, refine, and publish correlated environments for use in simulation, training, and experimentation.

Benefits

Correlated Terrain Development - TerraTools is the market leader in correlated terrain output. Develop and export from a single project to multiple correlated terrain exports including VBS4, VBS3, OneSAF, JCATs, Unreal, Unity, OpenFlight, CDB, and 3D Tiles.

Extensive File Format Support - Import and export a wide range of elevation data, satellite imagery, and vector data with varying fidelity, scale, and coordinate system information.

Automated Generation - TerraTools comes with a complete set of tools for the automated generation of content including fully-destructible buildings with complex interiors, large-scale road networks with AI navigation, and complex bodies of water.

Viewing & Editing Tools Included - Use built-in tools to quick-start projects; create, edit, and view geospatial data; edit and view textures and models; monitor progress; and preview the environment as you transition from source data to the final terrain output.

Flexible & Reusable - Configure TerraTools projects to process specific geospatial source data. Make incremental updates to an existing project to further enhance and refine the environment, then reuse as templates to fast-track future terrain production.

Scalability for Large Terrain Production - Automate the processing of geospatial data sets to generate large-area tiled environments. The Batch Mode Manager utility offers a management interface for handling tile-based terrain generation, and Distributed Processing instances allow users to scale production to leverage available resources on a single workstation, a local network, or in the cloud.

Mantle ETM - A Customized Terrain Pipeline

Making terrain for high fidelity simulation is difficult and challenging. Searching out good source data, building correlated terrain for multiple runtimes, synchronizing data between different simulation clients, storing the vast amount of source data, utilizing classified and other restricted data, editing data "on the fly". Historically, these challenges have resulted in separate specialist teams building terrain data disconnected from the point-of-need users together with high costs and long lead times to obtain the required finished terrain.

Streamlined Terrain Generation

Mantle Enterprise Terrain Management (ETM) is a custom-built platform based on proven COTS components and expert design/development services for creating simulated terrain for training, mission rehearsal, visualization and terrain analysis. A Mantle ETM installation delivers a cloud-capable[1] custom terrain pipeline that works with your data, processes, servers, and runtimes, integrating with your existing terrain capabilities or delivering a full end-to-end solution from scratch.

Effective: Mantle ETM simplifies enterprise-wide terrain handling for simulation and visualization by providing you a cloud-capable terrain server that can be integrated with your existing terrain capabilities.

Cost-Efficient: Mantle ETM reduces the manpower needed to develop and deploy terrain by offering a high degree of automation at every stage.

Scalable: Mantle ETM can be deployed on the cloud or on a local network, and supports synchronization between servers.

Proven: The Mantle ETM platform is based on robust COTS components - TerraTools components (for terrain generation), VBS4's Blue Data Pipeline technology (for procedural enhancement) and VBS World Server components (terrain storage and server capabilities).

Accessible: Mantle ETM is designed with ease of use in mind. Users can quickly learn to rapidly create and edit terrain on the fly with the VBS Geo editing tool, leveraging the 8,000+ 3D model content library. Edits can be stored and curated centrally.

Constant Enhancement: Mantle ETM components are enhanced regularly with new customer-driven requirements and significant internal investment driving feature improvements such as the curated global base data and extended support for new runtimes and streaming terrain formats.

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[1]Cloud is not required, Mantle ETM can also run on an internal network

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Pro Services & Training - Flexible Solutions. Real-World Benefits

Professional Services

BISim offers professional services to help customers develop cost-effective solutions to meet their unique simulation and training requirements. Depending on your needs, our professional services cover support at your location, over the phone, via remote video conferencing, by e-mail or at one of BISim's offices.

Our team of programmers, designers, artists and support specialists are experts in their fields and have access to core software engineers. We can help customers with a wide range of services:

Integration services - offers direct access to integration experts, developers, and engineers who assist from the system architecture level down to writing lines of code to provide cost-effective and tailored solutions to your unique use case.

Scenario development & model creation - our designers can create tailored and effective scenarios and our expert modelers together with the configuration team can transform real-world assets into high fidelity virtual models.

Terrain generation - our skilled terrain developers will help you create highly accurate geo-specific synthetic environments.

Custom scripting & engine enhancement - create new functionality within the VBS framework.
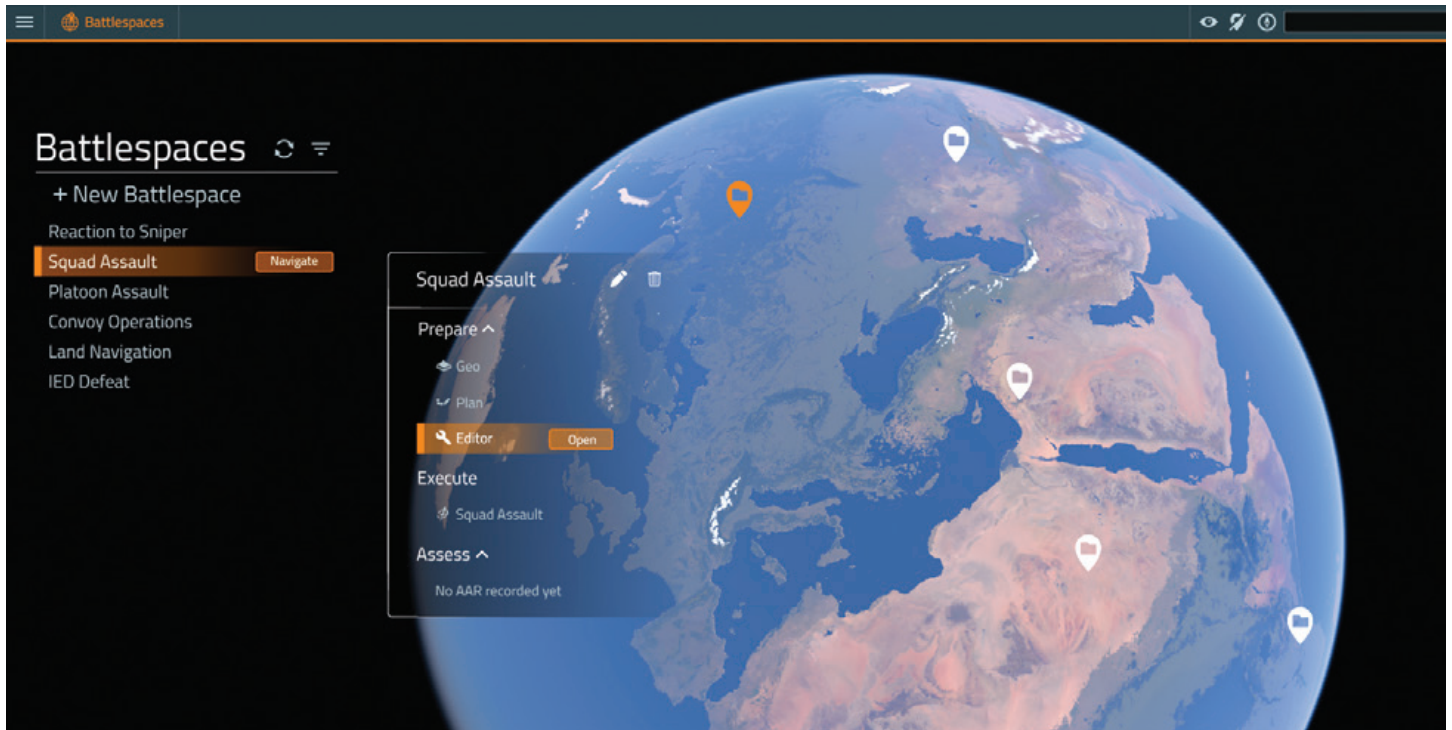
Training Courses

We offer professional training led by instructors who are well-versed in the best practices for using VBS products in military training. In our courses, instructors guide participants through hands-on activities that encourage learning engagement. Trainees are expected to demonstrate their understanding by applying their learning to create their own simulation scenarios. Contact training@bisimulations.com for more information.

VBS4

VBS4 Administrator Course
Introduces instructors and training facilitators to VBS4.

VBS4 Model Exchanger (MEX) Course
Aimed at model development and import through BISim's MEX tool for VBS4.

Scripting

VBS Scripting Levels 1-3 Course
Breaks down VBS scripting into achievable and practical examples students can use immediately.

VBS3

VBS3 Administrator Course
Introduces instructors and training facilitators to VBS3.

VBS3 Rigging and Model Import Course
Aimed at model development, rigging and import within the VBS3 developer tool "Oxygen 2."

VBS3 Terrain Generation Course
Guides students through a detailed pipeline of terrain construction through VBS3's terrain tool "Visitor 4."
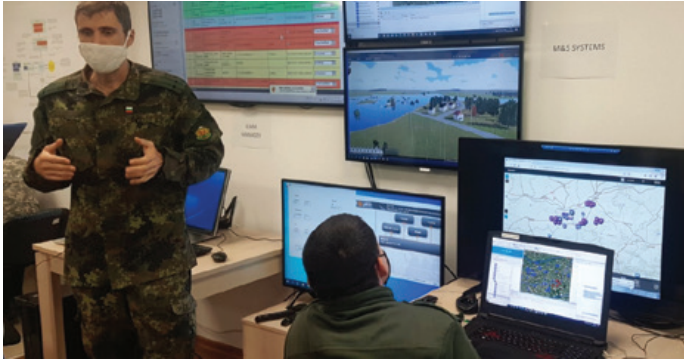
Terrain

Standard TerraTools Training
Learn how to use TerraTools to edit geospatial source data and create 3D terrain database environments.

Custom Advanced Training
The next step for those who wish to further maximize their productivity using TerraTools and our suite of source data preparation products.

What Our Customers Say

"VBS4 allows the control of the AI behavior of many various units to be executed by just one person. With proper planning and sufficient awareness of the system, many events of different scales can be reproduced and analyzed."
- Col. Orlin Nikolov, director, NATO's CMDR CoE

Previously using VBS3 for their crisis management and response education and training, CMDR CoE upgraded to BISim's VBS4 at the end of 2020. CMDR CoE uses VBS4 in combination with constructive simulations. VBS4 has already been used for a variety of training and simulation purposes by CMDR CoE. One of VBS4's first uses for NATO was to visualize and assess the consequences of an industrial accident involving simulation of a release of a dangerous gas.

"A major advantage of using VBS4 is its VBS World Server, which enables us to provide our customers with the ability to conduct training anywhere in the world." - Andreas Ulven Holmen, KONGSBERG Project Engineer/DLS Training


Kongsberg Defence & Aerospace, a subsidiary of KONGSBERG, Norway's premier supplier of defence and aerospace-related systems and solutions, partnered with BISim to jointly develop simulation solutions for the KONGSBERG family of PROTECTOR Remote Weapon Systems, which includes Remote stations and Remote Turrets. The result is KONGSBERG's CORE™ Training Simulator, which uses BISim's VBS4 for standard classroom-based simulator training and in-vehicle training available directly on PROTECTOR systems.

"To support helicopter training, we need software that delivers on land training. VBS4 and VBS Blue IG provides a large library of content and detailed terrain to ensure the delivery of immersive training for European operational helicopter crews." - Steven Pook, Head of Mission Training Devices, Inzpire Ltd

When the European Defence Agency (EDA) awarded Inzpire Ltd a contract to continue delivering their Helicopter Tactics and Helicopter Tactics Instructor courses at its new Helicopter Training Center at Sintra Air Base in Portugal, Inzpire moved to upgrade the simulation and virtual environment for its helicopter Mission Training Device. Inzpire turned to Bohemia Interactive Simulations to integrate VBS4 and VBS Blue IG into their Mission Training Device to provide helicopter crews with a fully immersive, networked, simulated training environment.
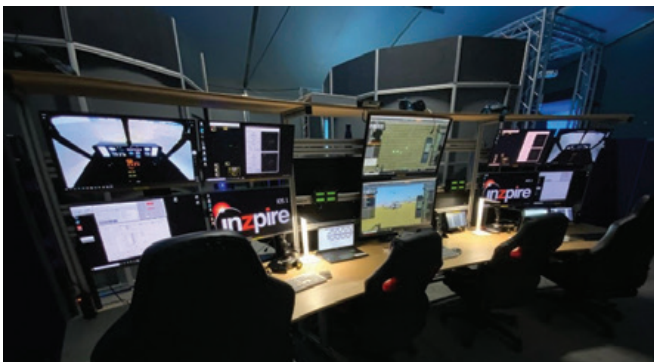
"The VBS4 scenario settings also make life a lot easier because we can quickly change from day to night and use the weather settings to introduce operators to different challenges." - Wes Fine, MAG Aerospace Product Manager

For MAG Aerospace, developers of FLIRSIM™ and a BISim customer, VBS4 offers a massive model library to create living cities anywhere in the virtual world for showing operators how to use the camera in real-life situations. Based on the actual technical specifications of the FLIR Star SAFIRE 380, FLIRSIM provides accurate systems modeling to ensure maximum training fidelity. FLIRSIM allows trainees to prepare for a variety of operational environments and weather conditions that sensor operators face in similar real-world conditions.

"Savronik has many custom devices on our simulation platform like scopes, laser units for weapons, vehicle and helicopter platforms and turrets to integrate VBS3. With the tremendous support of BISim and the API they offer to us, it was a very smooth process to integrate all of these devices with our custom plugins thanks to VBS3's modular and streamlined workflow. - Hikmet Safı, Project Manager, Savronik

Savronik's ShooterSim provides safe and environment-friendly advanced solutions for indoor shooting training. The system provides effective training to shooters with their own real weapons and ammo (real and blank), providing real sound and blowback. It is used for marksman and sniper training as well as part of the boat/vehicle and helicopter gunners, Military Operations in Urban Terrain (MOUT) and close-quarters battle (shoot house) simulators.

"With the crisp visual fidelity provided by VBS3, you can go right into a difficult dropzone and pick out trees, buildings, grass, and parts of the terrain that help trainees with the visual cues needed to make a safe and precise landing."
 - David Landon, President, Systems Technology Inc

Systems Technology Inc.'s VR-based parachute training simulator PARASIM® leverages the high fidelity, large terrain virtual environments generated by TerraTools from TerraSim rendered by VBS3 from BISim.

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