

MetaVR 3D Character Animation



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MetaVR Virtual Reality Scene Generator™ (VRSG™) has integrated support for high-quality animated 3D characters. The character animation and rendering is designed to support hundreds of characters simultaneously within the field of view while maintaining a high frame rate.



VRSG is delivered with a model library of over 285 characters and weapons in MetaVR's model format. You can immediately configure and use these models in VRSG. Additionally, the library includes nearly 300 character animations in the game industry standard BVH format; the animations portray all commonly used appearances required by the DIS protocol. You can also use your own custom characters, weapons, and animations in VRSG.

MetaVR's 3D characters consist of an inner skeleton and an outer "skin" mesh. The skin mesh is deformed in real-time according to the position of the skeleton. This technique prevents cracks or interpenetrating surfaces; it also creates realistic looking animations without requiring any excess geometry. In VRSG, the deformation is computed entirely by



Images on the cover: Real-time VRSG scene of an Afghan villager and donkey on MetaVR's virtual Afghanistan terrain, and close-up faces (textured and wireframe) of five models from the character library.

the graphics card to maximize performance. VRSG computes transitions between animations by smooth blending from one animation to the next. These automatic transitions minimize discontinuities and make it easier to add custom animations, without creating hand-authored transitions.



Creating your own characters

In addition to using the models in MetaVR's 3D character library, you can create and texture your own human characters in popular modeling tools such as Autodesk 3ds Max or Autodesk Maya using MetaVR's character template. MetaVR's character template includes an armature object containing a hierarchy of bones that matches MetaVR's BVH rig, as well as a low polygon mesh that is used by VRSG's physics. You export characters from your modeling tool in FBX format and then use MetaVR's new FBX-to-HPX conversion utility to convert the model to MetaVR's model format.

MetaVR's FBX conversion utility is available upon request to customers under active maintenance.

The example on the left shows the preparation of a model in Autodesk 3ds Max prior to exporting it in FBX format for subsequent conversion to MetaVR's model format. After converting the model to MetaVR's model format, you can inspect the model in MetaVR's Model Viewer.

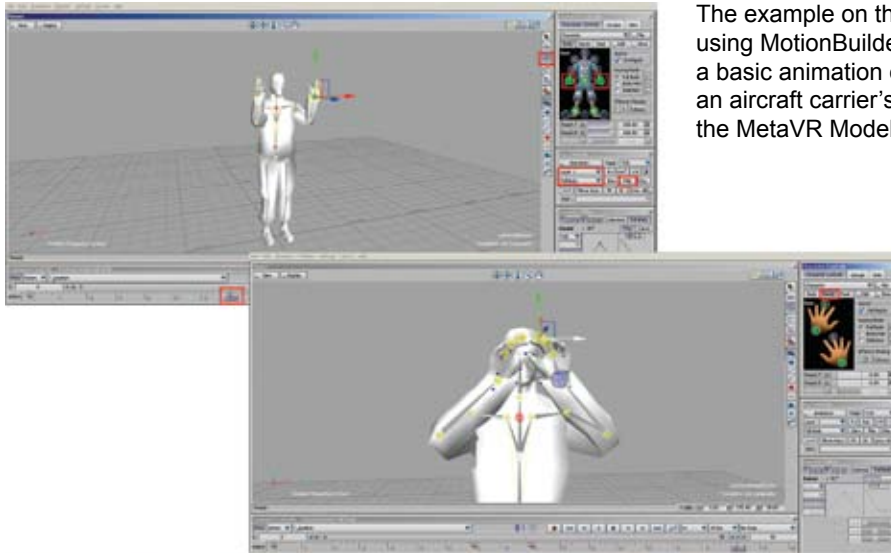


You can test an animation with your character displayed in the Model Viewer by dragging one of the BVH animations from the MetaVR character model library to the Model Viewer window. You can then inspect the animation playing in real time.

Creating your own animations

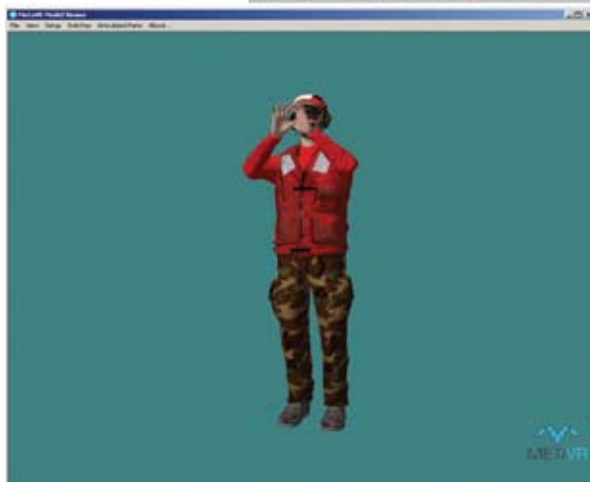
MetaVR characters use the MotionBuilder standard skeleton hierarchy for animation. MotionBuilder is one of the strongest animation tools available, ideal for building character animations for simulations and games. This approach enables you to import motion-capture data or use COTS software to create custom animation, and in turn use MotionBuilder to transfer your data to MetaVR's skeleton hierarchy.

The character model library includes a control rig in MotionBuilder's FBX format that contains the standardized skeleton used by all MetaVR character models. You can use MetaVR's control rig as the starting point for creating any new animations. Once your data is in MotionBuilder, you can create an optimized looped animation and export it in BVH format for use in VRSG.



The example on the left shows manipulation of the control rig using MotionBuilder features such as finger controls to create a basic animation of a common signal used by personnel on an aircraft carrier's flight deck, and previewing the result in the MetaVR Model Viewer.

The other examples on this page show animations that were created specifically for scenarios on MetaVR's Afghanistan 3D terrain.



First person control

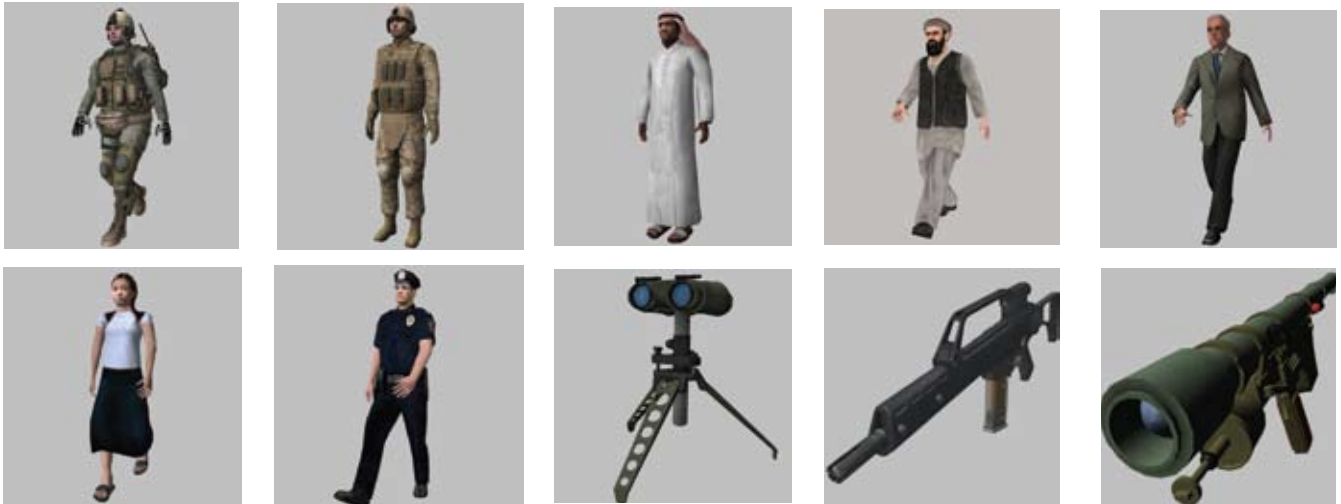
To simulate interaction among human characters in a networked VRSG session, you can use VRSG First Person Simulator™ (FPS) to control your character and view the scene from the character's point of view. An FPS character can take on the persona of any character with a weapon that you drag and drop onto this game-like first person shooter. FPS provides the means to simulate an individual while training for military operations.



By manipulating a gamepad you can control your first-person portrayal and actions such as standing, walking forward or backward, kneeling, walking crouched, crawling, firing a weapon, and lying prone. In addition to controlling the character's movements, the gamepad accesses various functions such as firing weapons, or laser ranging and target designating in JTAC/CAS mode.

Examples of models from MetaVR's 3D character library

MetaVR's 3D character library currently includes over 285 human character and weapon models and nearly 300 character animations. You can immediately configure and use these models in VRSG. The following are a few examples of the models in the library:



For more product information, pricing, and ordering, see MetaVR's web site at www.metavr.com or contact sales@metavr.com.

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