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I. Sensor RT 2010 3.00

Sensor 2009 offers visually intensive, interactive and exciting visualization. From games to military simulations, RTS provides the platform and tools to develop cutting-edge 3D projects.

The RTS renderer system features:

- Dynamic visibility determination, requiring no pre-processing
- Standard and high dynamic range (HDR) rendering pipeline.
- The gamma-correct, linear color space renderer provides for immaculate color precision while supporting a wide range of post-processing effects such as motion blur, depth of field, bloom, ambient occlusion and artist-defined materials and programmer supplied effects
- Support for modern per-pixel lighting and rendering techniques including normal mapped, Phong lighting; custom per material lighting models including anisotropic effects; virtual displacement mapping;
- 4 light attenuation functions for directional, point and spot lights
- Unified detailed character and scene lighting,
- Advanced shadowing, providing support for optimal shadowing mapping techniques
- Dynamic characters casting dynamic soft shadows on the scene using projected shadow maps.
- Support for complex characters and blendshapes
- Split-screen rendering, Multimonitor rendering
- High-resolution screenshot support.
- Optimized skinned mesh rendering.
- Render-To-Texture tools, allowing real-time dynamic reflections and static scene captures.
- An easily extensible post-process system with effects: Depth of field (DOF). Bloom. Screen space ambient occlusion. Tone mapping. Artist-defined materials. Motion blur.
- Powerful material and effect system
- Particle system
- Lens flares.
- Beams and trails.
- Support for huge complex terrains with datasets accuracy up to Float32 (Used for LIDAR data)
- Video textures support

The RTS Animation system features:

- Skeletal animation system supporting up to 4 bone influences per vertex and very complex skeletons.
- Blend controllers, performing an n-way blend between animations
- Data-driven controllers, encapsulating motion capture or hand animation data.
- Physics controllers,
- Skeletal controllers, for features such as having a head track a point in space
- Export tools for Maya for bringing weighted meshes, skeletons, and animation sequences into the software
- Boids, Flocking and Swarming system
- Multiple noise generators for procedural content manipulation and generation

The RTS Sound system features:

- 3D sound positioning, spatialization and attenuation.
- Multi-channel playback (4.0, 5.1, 6.1 and 7.1).
- Seamless looping of sounds
- Streaming sound support for background music
- Support for multiple sound capture devices
- Real-time phoneme recognizer for multiple capture devices

The RTS Physics system features:

- Rigid body physics is available for all objects
- Soft body physics for cloth and ropes is available for any object.
- Controllers for vehicles
- Full or simplified collision detection

The RTS Scripting system features:

- Powerfull scripting is included to extend and create own actions and events.

II. Typical Content Specifications

Here are the guidelines we're using in building content for RTS. Different scenes will have widely varying expectations of character counts, scene size, and performance, so these specifications should be regarded as one data point for one project rather than hard requirements for all.

Characters

For every major character and static mesh asset, we usually build one version of the geometry: a renderable mesh with unique UV coordinates, To use normal mapping, a detail mesh containing only geometry must be built too. Run two meshes through the normal mapper preprocessing tool and generate a high-res normal map for the renderable mesh, based on analyzing all of the geometry in the detail mesh.

Renderable Mesh: We build renderable meshes with 30,000–120,000 triangles, based on the expectation of 5–20 visible characters in a scene.

Detail Mesh: We build 1–8 million triangle detail meshes for typical characters. This is quite sufficient for generating 1–2 normal maps of resolution 2048x2048 per character.

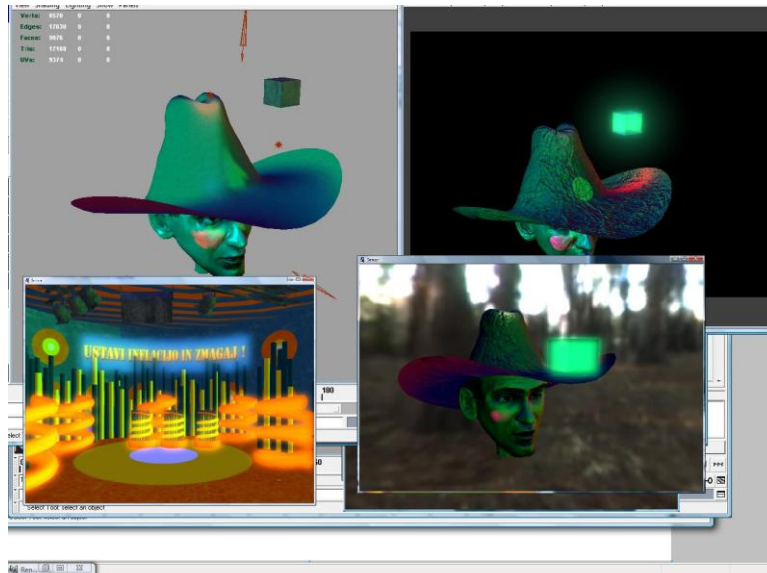
Bones: The highest version of our characters typically have 100–200 bones, and include fully articulated faces, hands, and fingers.



Hi-res face with multiple blendshapes with multiple light influences

Normal Maps & Texture maps

We are authoring most character and world normal maps and texture maps at 2048x2048 resolution. We feel this is a good target for running on PC's in the 2007 timeframe. Sometimes it may require reducing texture resolution by 2X, and up to 4X, depending on texture count and scene complexity.



Production

workflow Maya to Viewer

Environments

Typical environments contain 500–2000 total renderable objects, including static meshes and skeletal meshes. For reasonable performance on current 3D cards, we aim to keep the number of visible objects in any given scene to 300–800 visible objects. Our larger scenes typically peak at 500,000 to 1,500,000 rendered triangles.



Simple environment

Lights

With version 2.80, Sensor supports unlimited number of light sources using Deferred rendering approach. Each Omni and spot lights can also project custom texture and/or build/use its own depth shadow map. The detail of soft shadows can be programmatically defined.

The limit in unified lightning shaders for number of lights influencing on a mesh in a scene is 3 directional lights, 7 point lights, and 4 spot lights.

Alternative rendering route is available, where there are no hardcoded limits on light counts, but for performance we suggest to use unified lightning. In Alternative rendering route limit the number of large-radius lights affecting large scenes to 2-5, as each light/object interaction pair is costly due to the engine's high-precision per-pixel lighting and shadowing pipeline.

Terrain

Advanced terrain capabilities include ECW reading for huge texture datasets, retrieved by the RTS on demand with LIDAR float32 support and adaptive viewdependent triangulation of terrain meshes.

Data Input

A wide range of trackers is supported for controlling characters, scene events and animations. Multiple joystick controllers support. Support for Ascension and Intersense trackers also available upon request.

Custom License Terms

Please contact sensor@mediaatlas.si to discuss custom license terms.

Costumers & Support

RTS is constantly evolving software. It has been rewritten from ground up and is production proven. We provide our costumers constant support and implement features they request and need.

The RTS has also been used in the development of many non-traditional products, ranging from educational software to custom training applications.

Technical requirements

Some Sensor 2009 features are hardware dependant.

Amount of LIDAR data is limited to available system RAM. (approx. 90Mb for area 22 km)

For optimal user experience we recommend: 3.0 GHz, Shader Model 3.0 Capable graphics card