



Contact: Elina Heng
Terpin Communications Group
(310)821-6100 x108
elina@terpin.com

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**Virtual World Entropia Universe Selects State-of-the-Art CryENGINE 2(R) to Create the Future
Cutting Edge CryENGINE 2(R) to Bring Real-Life Look to World's Safest Virtual Universe**

GOTHENBURG, SWEDEN and FRANKFURT, GERMANY -- July 25, 2007-- Entropia Universe, the safest virtual world utilizing a real cash economy, has signed a license agreement to use the stunning high-tech game engine CryENGINE 2®, from German developer Crytek, creators of "Far Cry®" and upcoming "Crysis®." This will make Entropia Universe the closest-to-reality looking massively multiplayer online game ever seen. The transition to an Entropia Universe platform built around this new technology is expected to be finished by mid-2008, and will be available to all Entropia Universe partners.

Creator MindArk PE AB's CEO Jan Welter Timkrans explains, "The upgrade of Entropia Universe will be built around the spectacular features supplied by CryENGINE 2®, offering a complete and immersive experience to Entropia participants. It will create synergies between the proven and safe Real Cash Economy backbone, the Entropia storyline with colonists fighting to establish a new world, and the very life-like visuals supplied from CryENGINE 2®." He continues, "When we saw what the engine was capable of, we immediately understood that it would be perfect for Entropia, as both MindArk and Crytek are pioneers in their respective fields."

Avni Yerli, Crytek's Managing Director, says, "We are thrilled to have been chosen by such a well regarded and successful industry leader as MindArk to be their future engine provider for Entropia Universe. We think the combination of our CryENGINE 2® technology and their extremely popular virtual playground will result in a new kind of rich and immersive experience that has not been possible until now. It will also expose a wide new audience to the stunningly realistic graphics, environmental physics and believable animations which are made possible by the award winning CryENGINE 2® together with some of the most recent advances in PC hardware and operating systems."



Screenshots using CryENGINE 2(R)



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About CryENGINE 2®

Real time editing, bump mapping, dynamic lights, network system, integrated physics system, shaders, shadows and a dynamic music system are just some of the state-of-the-art features the CryENGINE 2® offers. The engine supports all video and hardware currently on the market. New hardware support is constantly added as it becomes available.

Some of the features available:

- Real Time Lighting and Dynamic Soft Shadows: CryENGINE™ 2 features natural looking light sources, and creates soft shadows that dynamically respond to natural movements. It includes high-resolution, perspective correct and volumetric smooth-shadow implementations.
- Volumetric, Layer and View Distance Fogging: Create clouds or fog banks which can hug the ground and realistically reduce both visibility and contrast, and properly interact with both dynamic lights and shadows, add depth and dimension to a landscape by reducing scene contrast and clarity for distant landmarks.
- Terrain 2.5D Ambient Occlusion Maps: On a per pixel level, approximates the amount of ambient (fill) light reaching an object (static or dynamic) depending on the amount of ambient occlusion created by the surrounding foliage and structures.
- Normal Maps and Parallax Occlusion Maps: Normal maps are used to project the contour details of a highly detailed object onto a low polygon model by using a high frequency compressed (3DC/BC5) texture in place of the polygon's surface normal in lighting calculations. CryENGINE 2 also supports parallax occlusion mapping to give a greater sense of depth to a surface texture applied to a polygon, such as could be used to realistically emphasize the relief surface structure of a brick wall, for example.
- Real Time Ambient Maps: Pre-calculate the amount of ambient (fill) light which will be applied to indoor surfaces, to improve the quality of lighting when applying real-time per-pixel lighting and shadows. This means the current light position and color can be dynamically added to the fill light intensity applied to illuminate surfaces in interior spaces.
- Subsurface Scattering: Simulates the diffusion and diffraction of light transmitted through translucent objects, like ice and jade; it can also be used to create natural looking skin or vegetation.
- Eye Adaptation & High Dynamic Range (HDR) Lighting: Eye Adaptation is used to simulate the human eye's adaptation to sudden or extreme changes in lighting conditions, like dark indoor environments suddenly transitioning to bright sunny outdoor environments, while HDR allows scenes with extreme brightness and contrast ranges to be more realistically rendered.
- Motion Blur & Depth of Field: Motion Blur is used to simulate the visual effect of using a slow shutter speed when tracking fast moving objects or making quick camera movements. Blur can be applied both to individual objects (object based motion blur), and/or to an entire scene (screen based motion blur), while Depth of Field can be used to focus the viewer's eye on a nearby object while subtly blurring objects in front or behind the point of focus.
- Light Beams & Shafts: These are used to create visually stunning light beams and shadows when light intersects with solid or highly detailed geometry, and can generate "godray" effects under water.

- High Quality 3D Ocean Technology: Dynamically modifies the ocean surface based on wind and wave direction, generating shoreline soft-clipping breakers automatically where the ocean meets the shore, depending on the shoreline contour and ocean depth, while our caustic simulation creates realistic looking moving shadows and highlights in underwater environments.
- Advanced Shader Technology: A script system used to combine textures and math in different ways to create unique effects such as cloaked, wet, muddy, and/or frozen surfaces which can be layered together and combined with more basic shaders such as metallic and glassy and other visual effects. Supports real time per-pixel lighting, bumpy reflections, refractions, volumetric glow effects, animated textures, transparent computer displays, windows, bullet holes, and shiny surfaces. Included are many unique new shaders which take advantage of the efficiencies of the unified shader architecture of DirectX 10.
- Terrain LOD Management Feature: This feature allows optimal usage of CPU and memory to display closer objects and terrain at a fine level of detail while enabling long view distances of over 8 kilometers.
- Integrated Multi-threaded Physics Engine: Can be applied to almost everything in a level, including trees and vegetation, to realistically model reactions to forces like wind currents, explosions, gravity, friction and collisions with other objects, without the need of specialized co processing hardware. Also allows for character to rag doll and rag doll to character transitions.
- Character Individualization System: The character pipeline uses a robust character attachment system which allows for attachment of skinned, animated, or physicallized attachments to the skeleton or polygonal faces of a character, to the extent you can even replace entire body parts such as heads, hands, or upper and lower body. A hardware based shape deformation system allows flexible variation of the character meshes. The system supports manually and even procedurally generated examples to ensure a small memory footprint. An additional variation system based on shaders is used for dirt, decals for clothes, and camouflage shaders for the skin.
- Parametric Skeletal Animation: By blending example-motions based on user-defined parameters, we obtain responsive interactive control over a character with a focus on believability and the ability to adapt automatically and naturally to the changing circumstances of a game environment. This enables the character to travel at different speeds, follow paths where the direction changes smoothly or suddenly, move uphill or downhill, dynamically blend in varying amounts of hit reaction animation, and/or change the style of locomotion.
- Procedural Motion Warping: Procedural algorithms like CCD-IK, analytic IK, example-based IK or physical simulations are used to augment pre-authored animations. All procedural methods have in common that a computer procedurally follows the steps in an algorithm to generate artificial motions. To avoid the typical computer-generated look when combining artificial and captured animations, we use a warping technique that can preserve the style

and the content of the base motion, despite the transformations needed to comply with the constraints.

- High Quality Animation Compression: Using our adaptive key frame compression technology, we can adjust the compression level to match the fidelity needed for any given animation while saving at least 90% of the RAM that would otherwise be consumed, without significant loss of motion fidelity.
- In Game Mixing: Integrated editor functionality and advanced sound specification tools provide efficient mixing by connecting to a running game instance on various target platforms. This constantly guarantees a well mixed game in every development stage by allowing review of the results in either the game itself, or in other editor modes, such as sounds triggered by animations from within the character editor, for example.
- Data-driven Sound System: Complex sounds can be easily created and delivered with studio quality while supporting any available surround sound speaker configuration. Multi-platform compatibility is guaranteed by FMOD's included sound library.
- Interactive Dynamic Music System: Improved playback of music tracks by specially defined logic that reacts to any desired game event in order to give the player a movie-like sound track experience.
- Environmental Audio: This feature allows a sound designer to achieve a dense sound impression by accurately reproducing sounds from nature, with seamless blending between different environments, for example the effect of moving from an interior to an exterior location.
- Dynamic World Sounds: Any physical contact can spawn a unique sound controlled by various parameters such as material type, object type, mass, and speed. This technique provides non-repetitive and responsive audio feedback to movement in an interactive game world.

More features are presented at: <http://www.crytek.com/technology/index.php?sx=eng2>

CryENGINE 2® video demo

A video showing CryENGINE 2 in action is available here:

<ftp://ftp1.entropiauniverse.com/movies/cryengine2.wmv> (150 mb)

About Entropia Universe

The heart of Entropia Universe is a distant planet named Calypso, which encompasses two continents with animal-filled wildernesses and large expanding cities that offer a variety of entertainment and social interaction for its participants. In Entropia, participants can create their own persona, or avatar, via a character-generation system, and then have the option of choosing a suitable life and virtual existence for their avatar. Characters are able to enter the evolving worlds of Entropia Universe, which are full of unexplored and uncultivated lands. Participants can join a community or even create a civilization of their own. Entropia offers a new avenue for individuals to pursue dreams, fantasies, and adventures in an astoundingly 'real' virtual universe.

Entropia Universe offers opportunities in numerous professions which are unique and completely different from that of the members' real life occupation. Entropia uses a system based on skills and experience which allows for occupational proficiency in areas ranging from event promotions and store ownership to hunting and mining. Entropians have the chance to buy and sell property, become financially successful, and even find a mate in their virtual world.

Entropia Universe is the only virtual gaming community in the world that actively supports sales of virtual products with actual cash value within its real economy system. The economy offers the user a secure and safe way to make purchases, sales and exchange real-life currency into PED (Project Entropia Dollars) and back again into real money, at a fixed exchange rate to the US Dollar, guaranteed by MindArk PE AB. PED allows members to invest in personal development and growth through the acquisition of goods, buildings, and land in the virtual universe. In 2006, the Entropia Universe turnover was a staggering \$365,000,000.

In December 2004, Entropia Universe set a world record certified by the Guinness Book of World Records, when it sold a virtual Treasure Island for US \$26,500, the largest virtual dollar amount spent, to 22-year-old Australian David Storey, a.k.a. "Deathifier." In October 2005, the sale of an asteroid-based space resort for US \$100,000 to famed gamer, Jon 'NEVERDIE' Jacobs, set a new record for the most valuable virtual item. In May 2007, MindArk sold five virtual banking licenses for over US \$400,000 to a diverse group of buyers including real world banks and financial establishments as well as Entropia participants. In June 2007, MindArk announced a partnership with Chinese company CRD with plans to launch Entropia Universe to the Chinese market in 2008, thus creating a billion-dollar virtual environment. For more information about Entropia Universe, please visit www.entropiauniverse.com

About MindArk PE AB

MindArk PE AB began in April of 2003 in Sweden, and are pioneers in the virtual world space. MindArk develops, supports and monitors the services and maintenance of Entropia Universe® -- The Safest Virtual Universe with a Real Cash Economy. Entropia Universe was launched in 2003 and has over 615,000 registered accounts. The company has been profitable since 2004. MindArk offers the Entropia Universe software to users free of charge with no monthly costs or associated subscription fees. For more information or to download the free Entropia Universe software please visit www.entropiauniverse.com. For more information about Entropia Universe's developer, MindArk, please visit www.mindark.com.

About Crytek

Crytek GmbH ("Crytek") creators of the multiple award winning next-generation first person shooter Far Cry®, and the upcoming blockbuster hit Crysis®, is an interactive entertainment development company with its headquarters located in Frankfurt Main, Germany and additional studios in Kiev, Ukraine and Budapest, Hungary. Crytek is dedicated to creating exceptionally high quality video games for the PC and next-generation consoles, powered by their proprietary cutting edge 3D-Game-Technology CryENGINE 2®. For more information about Crytek, please visit <http://www.crytek.com>.

Developers who are interested in obtaining a commercial license for the CryENGINE 2® middleware should mail their enquiries to cryengine@crytek.com

Crytek Contact:

Harald Seeley

Crytek

+49 (0) 69 219 7766 69

Email Contact