BRAINSTORM

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ESTUDIO

INDUSTRY'S MOST POWERFUL REAL-TIME GRAPHICS AND VIRTUAL STUDIO ENGINE

Brainstorm eStudio is a powerful and flexible tool that provides solutions for any kind of real-time graphics. The eStudio is unique in the market due to its sophistication, open architecture and versatility, enabling both design and real-time playout of virtual studios and 3D graphics as well as the easy creation of customized applications.

eStudio provides excellent results for applications such as News & Sports, channel branding, weather, entertainment, charts and graphics, interactive corporate presentations or film pre-visualization. Being the fastest 3D graphics render engine in the market, eStudio is complete solution for creating 3D Graphics and Virtual Studios to fulfill any broadcaster's needs.

ADVANCED REAL-TIME 3D GRAPHICS CREATION

Developed to deliver unlimited design capabilities for real-time graphics, eStudio is the industry's fastest real-time 3D graphics and virtual set solution, and the core engine behind Brainstorm's entire product range. Being the fastest 3D graphics render engine in the market, eStudio is complete solution for creating 3D Graphics and Virtual Studios to fulfill any broadcaster's needs.

EXTREME FLEXIBILITY
Following more than 20 years of development, eStudio is optimised for multithreading and multiple CPUs, and is able to fulfil any need in broadcast graphics, from real-time 3D Graphics to Virtual Sets, News&Sports, Entertainment, Presentations and Film Pre-visualization. With today's broadcasting requirements, reliability is a key concern, and eStudio is proving its robustness all around the world in demanding 24/7 operations.

OPEN ARCHITECHTURE
Brainstorm has always been equivalent to real-time operation, and our developments aim to increase our customer's creative possibilities while improving the visual appearance of their

graphics bringing the latest technology in 3D graphics hardware to its limits.

Brainstorm eStudio runs on standard PC workstations using GPU technology from NVIDIA and high-end video I/O cards to ensure the highest performance and compatibility.

OPEN HARDWARE INTERFACES
Brainstorm works closely with many hardware manufacturers such as NVIDIA, Bluefish, AJA, Blackmagic, FOR-A, and many other. Brainstorm has been pushing the boundaries of virtual set production and development for

over 25 years. Brainstorm pioneered the application of camera tracking to 3D real-time virtual set, and eStudio interfaces with practically all current tracking systems, making integration with any production hardware an out-of-the-box feature.

ACCESS TO EXTERNAL DATA

eStudio allows manual or automatic data input from external applications, databases or rel-time feeds in a variety of formats: XML, ODBC, Excel, RSS, etc. Data can be linked to graphics, statistic charts and any other element to create data-driven graphics with advanced animation and behaviours.

VIRTUAL SET PRODUCTION

Brainstorm has been pushing the boundaries of **virtual set production** and development for two decades. Brainstorm pioneered the application of **camera tracking** to 3D real-time virtual sets, and today eStudio interfaces with practically all current tracking systems, making integration with any production hardware an out-of-the-box feature.

As well as working as a high-end virtual set using camera tracking and external chroma keyers, eStudio also permits **inexpensive** virtual set productions thanks to its optional built-in chroma keyer and the ability to avoid the need

for camera tracking through control of virtual cameras and the insertion of the character as a live texture. All is coupled with an user-friendly operation and image quality, both paramount to ensure the best results for our customers.

AUGMENTED REALITY

The term Augmented Reality has been used lately to describe ways to enhance visual perspectives or views in a variety of media to describe information graphics applied to television programs, amongst other applications. As a form of Virtual Reality, is a method to overlay sinthetic images along with real

ones. Augmented Reality also requires the interaction between sets, talents and virtual objects, many of them created out of external data sources such as statistics, charts, bars, and many other. These data driven objects allow for visually engaging representations of the data which can be better explained by the presenters when placed in the set.

Since its very beginning, eStudio has provided Virtual and Augmented Reality for television programs, election coverage and entertainment shows, displaying data and information in a extremely attractive manner, providing broadcasters

more options to deliver complex and detailed data to their audience.

FILM PRE-VISUALIZATION

Brainstorm's eStudio can be used for 3D visualisation during green screen film production. Directors and film makers can see their shots, view different angles and be sure of the final result thanks of the real-time previsualization of the takes using eStudio technology, regardless the complexity of the scene. eStudio was used on numerous films such as I Robot, Artificial Intelligence, Speed Racer, Stealth, Alice in Wonderland, Xmen Origins or Hugo by film directors and actors to get an immediate real-time view and reference of what a take will look like before getting into expensive post-productions.

CUSTOM-BUILT INTERFACES

eStudio enables the easy drag-and-drop creation of customized interfaces for simple and intuitive control. The GUI is so flexible that the user can have just a few buttons for basic animations or detailed control panels for complex tasks. All the tools are there, but only those required are visible.

Simple drag and drop controls allow non-technical users to fully control of any element in the eStudio software and build their own applications.

The custom interfaces capabilities of eStudio have been further developed to the point of being able to create individual products based on it such as Aston or InfinitySet. New options include multi-splitters for interface panners or IconTrees allowing to insert portions of interface in the folder.

FLEXIBILITY IN GRAPHICS

From stills, tickers, lower-thirds or OTS to award-winning full screen graphics and animations, virtually **any kind of 2D or 3D graphic** can be accomplished with eStudio. It also **supports SmartTemplates** which can automatically look up data and redraw graphics accordingly. SmartTemplates allow manual or automatic **data input** from other applications, databases, spreadsheets or real-time feeds.
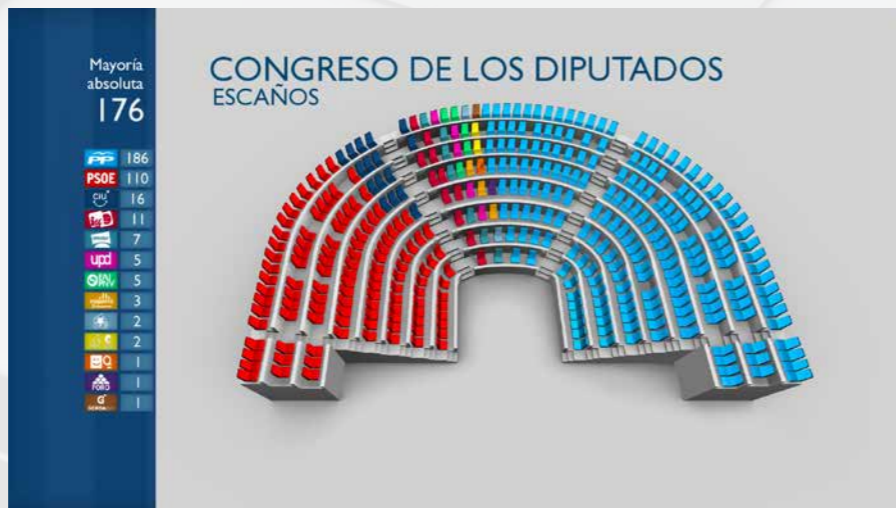
eStudio also imports **graphic files and 3D models** from 3D software packages in a wide range of 3D formats such as .fbx, .dae, .obj and.3ds, to name a few., plus image and video files, movies from disc storage systems and external video feeds.

ADVANCED MODELLING

The advanced modelling toolset of eStudio includes built-in geomtries and primitives, imported models, hyerarchy of objects, material and textures, built-in text effects and particle systems and much more. eStudio also allows texturizing objects using pictures and movies, extending the creative palternatives. Parameters are fully editable and animatable: geometry, size, appearance, materials... Also, objects can be adhered together, grouped and work as a unit when required.
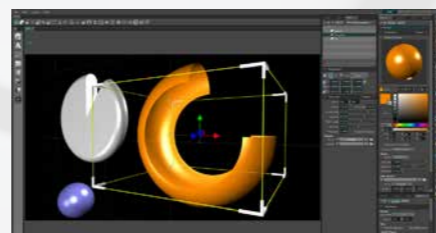
ADVANCED RENDERING

eStudio features advanced rendering options with fully OpenGL power with shaders, bumpmaps, shadows and impostors. Multi-texturing and multi-pass per material and customized filter shaders and 2D effects (distortion, bloom...) are also available. eStudio shaders support up to 32 inputs.
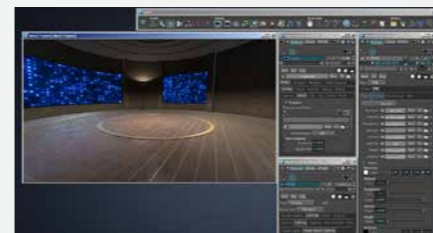
REFLECTOR OBJECTS

Real Render Object Reflection over flat surfaces via additional internal rendering from a reflected camera position.
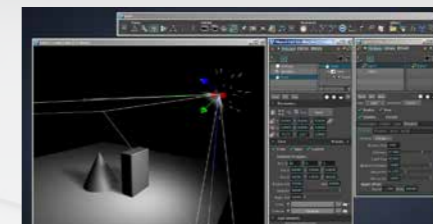

SUPPORT FOR PBR SHADERS

eStudio supports PBR (Physically Based Rendering) shaders as materials, and can also be imported from external shader editing software.

SOFT SHADOWS ALGORITHM

eStudio renders real-time soft shadows from 3D lights parameters using a dedicated algorithm.
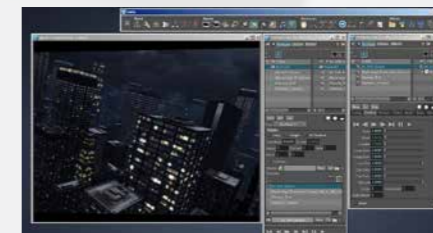

SELECTIVE DEFOCUS

Using the real camera's parameters, eStudio applies a selective defocus algorithm on the virtual scene.

PLAYLIST TEXTURES

eStudio can run a playlist of pictures and clips with multiple start, end and looping points.

eStudio has taken advantage of the development of character generation in Aston, which lead to the implementation of many text and font features usually available only in high end character generators.

New Text Editor allows to apply effects such as color, font, size and style effects (bold, italic, underline) by simple selection. eStudio provides full support for complex languages (Thay, Devanagari, Vertical Japanese, etc.). Advanced features:

- Three-border configuration
- Each layer can have different colors and textures
- Emboss for layers and borders
- Configurable shadow layers for color, size, blur, transparency, etc.
- Font Families for Normal, Bold, Italic and Bold-Italic

TrackFree

TrackFree™ is a new and advanced technology patented by Brainstorm that represents a totally new and revolutionary approach to virtual set production. It is a camera-tracking independent technology that enables broadcasters to combine the precision and high quality of tracking systems but at the cost of a trackless system, and with matching flexibility and user-friendliness. The TrackFree™ technology is the culmination of many different R&D projects Brainstorm has conducted over the last few years, and includes game-changing features.

TELETRANSPORTER

Allows the insertion of real people as

TeleTransporter

Augmented Reality objects into remote scenarios in real-time, matching the tracking data of both the main studio and the remote location to create the illusion of absolute realism. This feature seamlessly combines 3D virtual sets with real characters and live or pre-recorded video feeds, all moving accordingly with precise perspective matching. This allows presenters, as well as 3D objects, to be inserted into videos from remote locations.

Thanks to the TeleTransporter feature, InfinitySet can undistinguishably use real, live or pre-recorded footage to use it as the background set for the chroma keyed talent. This functionality allows a remote talent to enter any stage at any time, while seamlessly mixing real and virtual elements. In
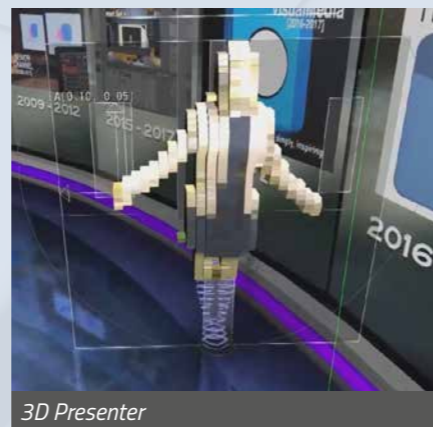
3D Presenter

more practical terms, it allows for enhancing the corporate image of a large broadcaster, as it can reuse a single real set to be the background scenario for smaller stations in the network.

3D PRESENTER

This brand new feature enhances the realism of the talent inserted within the virtual set, achieved by generating a true 3D representation of the talent from a video feed, creating a real-time 3D volume that is continuously regenerated, repositioned and remapped based on the camera parameters. This means that the presenter is not a simple superimposed 2D sticker over the 3D virtual studio environment, but an actual 3D object embedded within the virtual set, casting real shadows correctly applied to the synthetic objects in the scene from the virtual lights de-

Selective defocus and bokeh

fined on the set. 3D Presenter allows the talent to be seamlessly inserted within the 3D studio environment and to interact with both real and 3D elements within the scene, for example, shadows over a real desk and simultaneously with reflections on a virtual floor. In addition to that, it allows for advanced features such as selective defocus and bokeh or volumetric lighting for the talent.

HANDSTRACKING

Permits the triggering of events and animations just with the simple movement of the bare hands and without the need for any additional devices.

FREEWALKING

A feature which enables talents to freely move about the green screen thea-

tre. Thanks to the FreeWalking feature presenters can move forward, backwards and sideways even though the real camera is in a fixed position.

VIRTUALGATE

Thanks to VirtualGate, a presenter in the virtual set can walk into a virtual screen, into the featured news and be
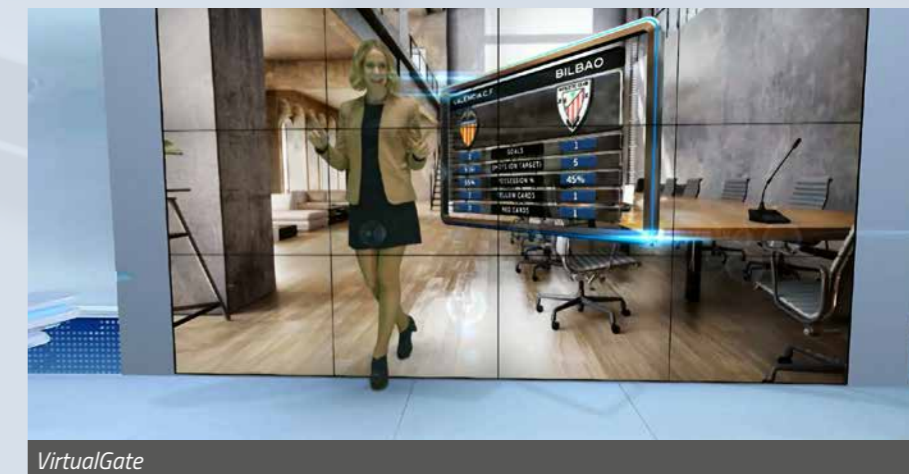

VirtualGate

part of the video itself with full realism regardless it is shown full screen or as part of the set. The talent enters and exits the video with full precise and accurately matched perspective, and once inside the clip it behaves correctly in terms of spatial reference and with the inclusion of realistic shadows, defocus etc. This feature extends the virtual scenario beyond the virtual set and creates an infinite world for the presenters to be in, allowing for better real-time content possibilities and interaction.

VIDEOCAVE

It is a Mixed Reality application using monitors in a real set performing as a CAVE multiple window, with virtual elements coming in from the virtual windows to the real scene as viewed from a tracked broadcast camera.

COMBINED RENDER ENGINES

All Brainstorm products run on the eStudio render engine, considered one of the most powerful and versatile engines in the industry. However, Brainstorm also supports gaming and architectural engines such as Unreal Engine. These highly complex engines provide realistic scenes with great possibilities, and played along with the eStudio render engine allows eStudio not only to show excellently rendered realistic background scenes, but also to integrate graphics elements in the final scene, like 3D motion graphics, lower-thirds, tickers, CG and many other elements. With the inclusion of these graphic elements, the scene can result in a highly complex composi-

tion, seamlessly integrating in real-time different render engines, virtual 3D backgrounds, real characters and synthetic graphics elements.

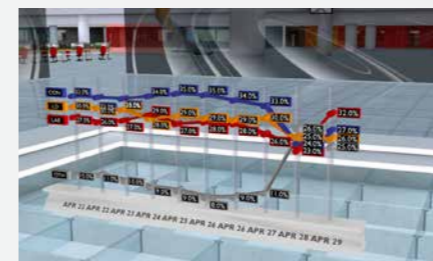Brainstorm approach to external render engine support is unique in the

industry, as it allows to control in real time different Unreal engine's parameters from eStudio, being the camera data just one of them, and allows merging both engines' render parameters and buffers to make them work as a single render engine.

OPEN HARDWARE INTERFACE

Brainstorm has been a prioneer company in using advanced GPUs and works closely with many hardware manufacturesrs such as NVIDIA, Bluefish, AJA, Blackmagic, FOR-A, NewTek and many other.

Having been at the very heart of camera tracking development since the early 90's, eStudio also interfaces with most camera tracking systems.