Proven 3D technology for today and tomorrow

Architecture and engineering  Government  Home theater
Design and manufacturing  Medical  Museums
Education  Research and development
Energy  Simulation and training
Entertainment
Events
Overview

When you mention the term 3D, most people think of Hollywood and the 3D movies that are capturing our minds and imaginations today. However, 3D has a long and substantial history outside of the cinematic experience. “Professional” 3D, sometimes referred to as advanced visualization or immersive visualization has been having a positive impact on a global scale for decades, though it has been utilized in more of a “behind the scenes” support type of function.

Today, a wide range of applications make use of 3D technology to provide a host of benefits – from decreased costs through virtual design prototyping, increased effectiveness while exploring oil deposits and wells, never-seen-before perspectives designed for medical and scientific research programs, or having fun at a theme park. But it’s not just any 3D technology that has been used – only Christie has been there since the beginning. A true pioneer in the development of 3D projection technology, only Christie can offer the expertise that is needed for today’s emerging 3D display applications.

Christie understands 3D

With 3D, it’s all about having a good experience, and image quality is a key factor to having a good 3D experience. Christie’s projectors offer exceptional images that are crisp, clean and finely detailed for a truly life-like 3D experience.

With a three-decade history of development and integration of 3D displays, Christie offers you the benefit of experience. Evolving from original CRT-based technology, we developed a truly game-changing 3D display with the world’s first purpose-built 3-chip DLP® active stereo projector, the Christie Mirage. Christie Mirage is now a full 3D display product line that offers a range of brightness levels, resolutions and active or passive stereo options that enable 3D displays to be used in any application.

The Christie difference

Broadest range of products
3D upgrade packages for select Christie 3-chip DLP® projectors
Accessory kits complete the package – active and passive glasses, emitter and filters are available through Christie
Christie Vista Spyder/Christie Spyder X20 – flexible source management with 2D/3D high performance functionality
Backed by industry-leading global warranties, service and support

Applications for 3D technology

Whether you need 3D today or tomorrow, Christie’s 3D capable projectors offer brightness levels ranging from 2900 through 20,000 ANSI lumens and resolutions that include SXGA+ (4:3), HD (16:9) and WUXGA (16:10). Whatever your application might be, Christie has a 3D solution that fits.

University of Reims Champagne-Ardenne (URCA), 3D display used for scientific research and development
Benefits of 3D

- Provides perspective not possible with traditional 2D software and tools
- Reduces time to market
- Excites audiences... WOW! factor
- Accelerates understanding
- Facilitates faster, more accurate decisions
- Enables faster, more intuitive interaction with data
- Promotes collaboration and focus on collective strengths
- Ensures greater accuracy of concepts and designs
- Removes inherent boundaries found in traditional tools
Types of projected 3D displays

The creation of a 3D or stereoscopic display is based on the principle that a person's eyes see two different viewpoints. These two distinct viewpoints are then projected onto a screen so that each eye sees the proper perspective – the left eye sees only the left-eye viewpoint, and the right eye sees only the right-eye viewpoint. The brain then reads both viewpoints simultaneously to produce a single image with the depth necessary to make it appear three dimensional.

There are two ways to present 3D content – active stereoscopic or passive stereoscopic displays. See explanation of these on the right.

35% score increase for students who were taught in 3D versus those not exposed to 3D training

Classroom³ Initiative, a partnership with JTM Concepts and the Rock Island-Milan School District

Visualization improves learning by 200%

University of Wisconsin

Visualization takes 40% less time to explain complex ideas

Wharton School

Active stereoscopic viewing

With an active stereoscopic display, the image is shown sequentially between the left and right eye. Liquid crystal shutter glasses are required to view this type of display. The glasses synchronize to flash (open and close) based on timed refresh rates of the left-eye and right-eye images. An emitter is used to time the shuttering of the glasses with the data and the projector.

An active stereoscopic display can be configured using a single projector, or displayed with multiple projectors blended into a single, larger viewing area.

Dual channel active 3D stereoscopic rear projection system creates life-sized medical treatment room

$\text{Active stereoscopic viewing – single projector}$

$\text{Active stereoscopic viewing – multiple projectors}$
3D Overview

Passage:

Passive stereoscopic viewing

With a passive stereoscopic display the image is split into the left or right eye through polarization filters used both at the projector and as part of lightweight glasses that the user wears.

Single projector configuration

A screen fixed in front of the projector lens (passive modulator) filters or splits the image into left eye and right eye perspectives. The polarized glasses worn by the user contain additional filters that allow the right eye to only see the right-eye image, while the left-eye image is passed to the left eye only.

Dual or “stacked” projector configuration

A projector is used to distribute the viewpoint of each eye. A polarizing filter (passive modulator) is placed in front of each projector lens to ensure left-eye and right-eye perspectives are passing through to the proper eye.

Upgradability

Christie makes it easy to future-proof your investment by being the only projector manufacturer to offer full upgrade paths for select 3-chip DLP® 2D projectors and Mirage Series (3D) models. This factory service upgrade adds advanced 3D capabilities to most models in Christie’s 0.95” 3-chip DLP® family of products.

Display 2D and 3D content simultaneously

3D and immersive displays are designed to get more from your data, but does all content need to be viewed in 3D to maximize its impact? In some applications, it’s necessary to work with both 2D and 3D content simultaneously. Several projectors (including Christie projectors) on the market provide Picture-in-Picture (PIP) capabilities, but in some situations PIP simply does not provide enough data interaction.

Previously, 3D displays and configurations were cumbersome and more complex, and they extended far beyond the scope of mainstream technology and their users. Switching back and forth between 2D and 3D content was not only challenging, it wasn’t an effective use of time or resources.

The Christie Spyder X20 offers an easy-to-use solution that enables both 2D and 3D content to be displayed simultaneously on the same screen. As well, with 3D content becoming more readily available and the demand for 3D formats to become standardized for professional applications, the Spyder X20 offers almost limitless inputs, and turns your display into an efficient, collaborative decision-making environment.
Types of 3D content

Whether your data content or images are being generated by a computer, a Blu-ray player, a gaming console, or a server – 3D content comes in a wide variety of shapes and sizes. And, without standards, the format of content distribution can have a serious impact on your 3D experience.

- **Frame sequential – native 3D**
  The sequence of single, alternating frames where each successive frame carries the image meant for either the right or left eye. The image is viewed by each eye at 60 frames per second (FPS). Each eye sees the full resolution of the image. This type of 3D is also known as frame alternative or page flip.

- **Frame doubled**
  The alternating sequence of the image is shown to either the right or left eye, but each frame contains a subframe of the same image. These images are seen twice by each eye at 30 FPS (compared to 60 FPS) providing a 3D image that is viewed at 96-120Hz. This method improves content that might have flicker issues due to low refresh rates.

- **Frame tripled – triple flash**
  The alternating sequence of the image is shown to either the right or left eye, but each frame contains two subframes of the same image. These images are viewed by each eye at 24 FPS, which creates a sharper, more detailed and true-to-life 3D display.

- **Frame packed**
  The frame packed method has a single frame of Full HD 3D (FHD3D) content containing both frames for each eye. To maintain full 1080p resolution, the subframes for each eye are stacked vertically one on top of the other. The specification for this format states that the two vertically stacked subframes must also be separated by a buffer zone (or active blanking zone) that consists of a blank 1920 × 45 pixel strip between the two subframes. As a result, a single frame has a resolution of 1920 × 2205. All HDMI 1.4 compliant displays (Blu-ray) need to be able to handle this frame packing format.

- **Top/bottom**
  Also known as top/down, over/under and above/below, this method of displaying 3D uses two images that are presented together, one on top of the other. A single frame contains a vertically scaled combination of the left and right eye together. The image is vertically scaled at half 1080 or 720 resolution and then extracted as frame sequential left and right, but must then be rescaled to full resolution. Typically 3D gaming consoles use this type of 3D.

- **Side by side**
  Typically used for broadcast, side by side content presents two images beside each other. A single frame contains a horizontally scaled combination of the left and right eye. Each image is horizontally scaled at half 1080 or 720 resolution. The image is then extracted as frame sequential left and right, but must then be rescaled to full HD resolution. This method is ideal for 3DTV broadcast – 1080i.
Christie's 3D capable projectors offer brightness levels and resolutions that include SXGA+ (4:3), HD (16:9) and WUXGA (16:10). Whatever your application might be, Christie offers the following 3D platforms:

The Christie Mirage Series offers the broadest range of 3-chip DLP® 3D active stereo projection systems for applications using a single projector, or a multi-projector array. The first purpose-built stereoscopic line of projectors, this series includes a brightness range from 2900 to 20,000 ANSI lumens. Designed specifically for use in a variety of 3D applications and displays on curved or flat screen surfaces, these projectors are ideal in virtually any environment you can imagine.

The Christie Mirage M Series is a high-performance, active stereo projector series that provides a brightness range from 6300 to 10,500 ANSI lumens, with reduced overall operational costs. Easy to set up and configure, they're compact, yet both powerful and flexible in performance. Powered by dual image processing, the Christie Mirage M Series displays full resolution at a native frame rate up to 120Hz.

Mirage HD3, 2900 ANSI lumens, 1920 x 1080

Mirage S+20K, 20,000 ANSI lumens, 1400 x 1050

Mirage WU12K-M, 10,500 ANSI lumens, 1920x 1200

Christie Mirage 3D solutions

The Mirage Series of projectors provide the highest quality images, life-like colors, and superior quality to ensure your 3D experience is as real as it gets... every time.

3D mapping – China State Bureau of Geography, Survey and Mapping

Mirage 3D Eyewear. For more information on Christie's full list of accessories talk to your Christie representative.
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