



Australian Visual Software Distributors Association Ltd

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Manager
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Australian Communications and Media Authority
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Submission by the Australian Visual Software Distributors Association to the Australian Communications and Media Authority Discussion Paper titled Temporary Trials of 3D TV and Other Emerging Technologies.

Introduction:

The Australian Visual Software Distributors Association (AVSDA) represents the \$1.4 billion Australian home entertainment film and TV industry which includes digital copies of films on DVD and the new high definition standard of Blu-ray. AVSDA members also represent content made available via download, streaming video on demand or electronic sell through (ie to own a digital copy).

Members include Roadshow Entertainment, Buena Vista, Universal, Paramount, Sony, Twentieth Century Fox, Warner Home Video, Madman Entertainment, Hopscotch, Anchor Bay, Fremantle and Time-Life thereby covering major Australian independent distributors as well as all the major Hollywood Studios.

AVSDA members are responsible for all the 3D Blu-ray content that is currently available in Australia and the vast majority of what will be available in the future.

The Discussion Paper requests input from motion picture and DVD sectors (page 5). Furthermore, on page 10 the ACMA Paper says:

This section of the discussion paper—together with the following sections on spectrum availability, licensing and consumer issues—therefore focuses

*primarily on free-to-air television, rather than on other broadcast platforms such as direct-to-home satellite and cable delivery which can also deliver 3D TV, or the use of 3D in the cinematic, DVD, Blu-ray and gaming environments. Nevertheless, the ACMA recognises that 3D TV is emerging as a consumer application more generally. **It is interested in understanding the evolution of 3D technology across any relevant platform [emphasis added].***

We therefore welcome this opportunity to make a submission to ACMA on the exciting technology that is rapidly emerging, namely 3D content to be viewed in the home.

Should the ACMA have any questions or require further information about what is contained in this submission, please contact AVSDA CEO and author of this submission, Simon Bush on simon.bush@avsda.com.au or phone 02 9258 1971.

Defining 3D:

AVSDA believes it is important to be clear about the term and use of 3D in the home thereby helping avoid confusion for the consumer about the experience on offer.

There are three broad types of 3D film and TV that can be accessed through a 3D capable TV:

1. Certain TV panels can upscale a 2D broadcast into 3D (often called dimensionlisation);
2. 3D broadcasting via satellite or cable (the ACMA broadcasting trials of major sporting events is an example of the former); and
3. 3D on Blu-ray Disc (BD).

The first type of “3D” is only offered by two panel manufacturers. AVSDA believes that this is not true 3D and provides an inferior experience to the consumer. Certain TV manufacturers have decided to not include this feature on the basis that it does not offer the consumer a true 3D experience and could adversely affect their purchasing decision.

3D broadcasting as being delivered overseas and trialled in Australia by the free-to-air networks (and subscription) TV is done so via satellite and usually involves sending the digital data streams over their existing HD infrastructure. 3D broadcasting at this stage – due in part to available bandwidth and infrastructure issues – is limited to 720p to each eye and cannot offer 7.1 dolby sound that BD offers (ie roughly halving of the HD standard of 1080 so that it can be delivered using the existing HD network).

The Blu-ray Disc Association (BDA) created a task force made up of executives from the film industry and the consumer electronics and IT sectors to help define standards for putting 3D film and 3D television content on a Blu-ray Disc.



On Dec. 17, 2009 the BDA officially announced 3D specs for Blu-ray Disc, allowing backward compatibility with current 2D Blu-ray player. The Blu-ray 3D specification calls for encoding 3D video using the "Stereo High" profile defined by Multiview Video Coding (MVC), an extension to the ITU-T H.264 Advanced Video Coding (AVC) codec currently supported by all Blu-ray Disc players. MPEG4-MVC compresses both left and right eye views with a typical 50% overhead compared to equivalent 2D content, and can **provide full 1080p resolution backward compatibility with current 2D Blu-ray Disc players.**

This means the MVC (3D) stream is backward compatible with H.264/AVC (2D) stream, allowing older 2D devices and software to decode stereoscopic video streams, ignoring additional information for the second view.

Sony released a firmware upgrade for PlayStation 3 consoles in September that enables 3D Blu-ray Disc playback. Sony previously released support for 3D gaming on April 21, 2010.

In summary, Blu-ray Disc is the only format that can offer true 3D 1080p 7.1 sound in the home environment. The broader manufacturing and software industry has also agreed on the standard for playback and connectivity of 3D capable devices, namely the HDMI 1.4 standard.

BD is the preferred medium for true 3D content as the capacity of the disc can now reach up to 100 gigabytes with recent developments. However, most dual-layered BD discs currently hold 50 gigabyte making it the perfect medium to carry a 3D film which can be up to 40 gigabytes in capacity. By way of comparison a standard DVD can only hold 20 gigabytes worth of data.

Respected industry research organisation ScreenDigest, in its September 2010 research bulletin, succinctly summarises the differences in quality between broadcast 3D and 3D on Blu-ray Disc and gives its view of the importance of BD on the adoption and success overall of 3D in the home:

Both Blu-ray Disc (BD) and broadcast will deliver 3D to home viewing systems, but BD potentially has an important role to play early in home 3D's development.

The hi-def format can initially supply more diverse 3D content, especially feature films, to the home since live events will dominate 3D broadcast in the short term. BD also currently delivers the highest resolution 3D possible to the home, providing 'full HD' 1080p to both left and right eyes. Bandwidth

restrictions mean that broadcast can only deliver half that of 1080i to each eye, or half 720p for 3D sports, until the next generation of set-top boxes launches.

Different types of 3D: evolution of the technology

3D filming techniques were invented in the 19th century with Hollywood embracing the technique of filming with side by side cameras in the 1950's and 1960's. Many recall the red and blue paper glasses required to watch these early 3D films. This form of 3D is called anaglyph and the technology and glasses did not allow for good quality colour reproduction or viewer experience by today's standards.

The new digital 3D cameras available today for filming and broadcasting in 3D still requires the use of glasses in the theatre or the home. These 3D images are produced using stereoscopic technologies that give the illusion of 3D depth by displaying different images for the left eye and right eye. The brain combines them into a single image.

The approach by most manufacturers is the adoption of active shutter glasses which receives a signal via infrared or Bluetooth transmitter that alternately turns the lenses in the glasses on and off in synchronization with the signal. It does this 120 or more times a second, which is too fast to notice.

A number of hardware manufacturers are researching ways in which 3D images can be viewed in the home without the need for glasses; called autostereoscopic.

Toshiba is to launch two autostereoscopic (glasses-free) 3D TVs in Japan in December 2010. A 12-inch model will retail for ¥120,000 and a 20-inch version for ¥240,000. Both TVs are based on LCD technology, can convert 2D images to 3D and have a 40 degree viewing angle. No plans for release in other territories have been confirmed at the time of writing. Toshiba also demonstrated a prototype 56-inch autostereoscopic 3D TV at CEATEC, the Japanese consumer electronics trade show this month (October).

Sharp displayed a prototype 3.8-inch and 10.6-inch autostereoscopic 3D TVs at CEATEC.

All standardised 3D capable input devices will be screen-agnostic, meaning that they will be compatible with all 3D TVs, regardless of the technology used to display the 3D image. Therefore, the availability of autostereoscopic 3D displays will have no repercussions for 3D BD players or 3D-capable TV set-top boxes as these will retain their compatibility.

According to ScreenDigest analysts, although a notable step for TV technology, the small screen size and high price of these early models confirm that autostereoscopic displays are still a long way from becoming a viable alternative to the glasses-based 3D TVs currently on the market.

One of the biggest issues limiting screen size is the requirement for the viewer to sit in a specific spot to fully experience the 3D image (eg, the 40 degree viewing angle cited by Toshiba). As screens become larger they must also allow for multiple viewers, each of whom must be able to see the optimum image, making the issue of viewing angles and position even more complex. As a result, Screen Digest anticipates that the launch of reasonably priced autostereoscopic 3D TVs over 40 inches is still a decade away.

Threats to 3DTV: Piracy undermining infrastructure and content investments

The 3DTV trials will inevitably lead to decisions about progressing with dedicated 3DTV broadcasting channels and 3D production in Australia as it has done elsewhere in the world. This requires significant investment in infrastructure, spectrum and content for this new technology to be successful.

Anything which undermines this significant investment should concern the networks, the government as it does content producers and owners.

Film and TV piracy will impact these investments due the following developments:

- 1) All 3D TV's sold are also IPTV's in that they have internet connectivity built in;
- 2) As this submission demonstrates, 3D BD filmed content is currently available and will be so in increasing numbers which will be a large driver of the uptake of 3DTV and related broadcasting; and
- 3) The capacity and speed of broadband, separate and in addition to the NBN as well as ever improving compression technology, will increase to the point that the large file sizes of 3D films will be able to be downloaded and played directly onto the TV. In other words, large file size will not be a barrier to 3D piracy in the short term.

It is this chain of developments, and the ability to download and watch pirated 3D content directly onto the 3D capable TV set should concern the ACMA and the wider government as it does AVSDA and the film and TV industry.

We are in discussions with the Government around solutions (such as graduated response mechanisms) to deal with these threats and would welcome the ACMA's recognition of this threat and support of appropriate policy responses.

Discussion Paper questions:

3. The ACMA invites comments on the likely demand for and availability of 3D content during and beyond the digital transition period of the next two to three years.

It is AVSDA's view that 3D broadcasters will initially look at major sporting events as a way to drive viewer and subscriber numbers. Subscription TV providers will look to 3D broadcasts as a way to drive people to their premium subscription

offerings. While current 3DTV set penetration is limited in 2010, I would expect penetration of panels to change dramatically over the next few years.

AVSDA agrees with recent [ABI Research](#) into the emerging global 3DTV market when it said:

Content Availability - 3D TV sales cannot be driven solely by movies and physical media such as Blu-ray disc sales. The development of 3D broadcast content including sports, special events and original programming will be a key driver for consumer adoption of 3D TVs and other supporting devices.

Content Quality - In addition to the content becoming available, it needs to be of a high enough quality to engage viewers and create sufficient momentum to sell devices. Bad horror movies released at the theatre will not compel consumers to seek out 3D in the home. Technology vendors including Samsung and others are partnering with content producers to ensure that quality content is brought to consumers.

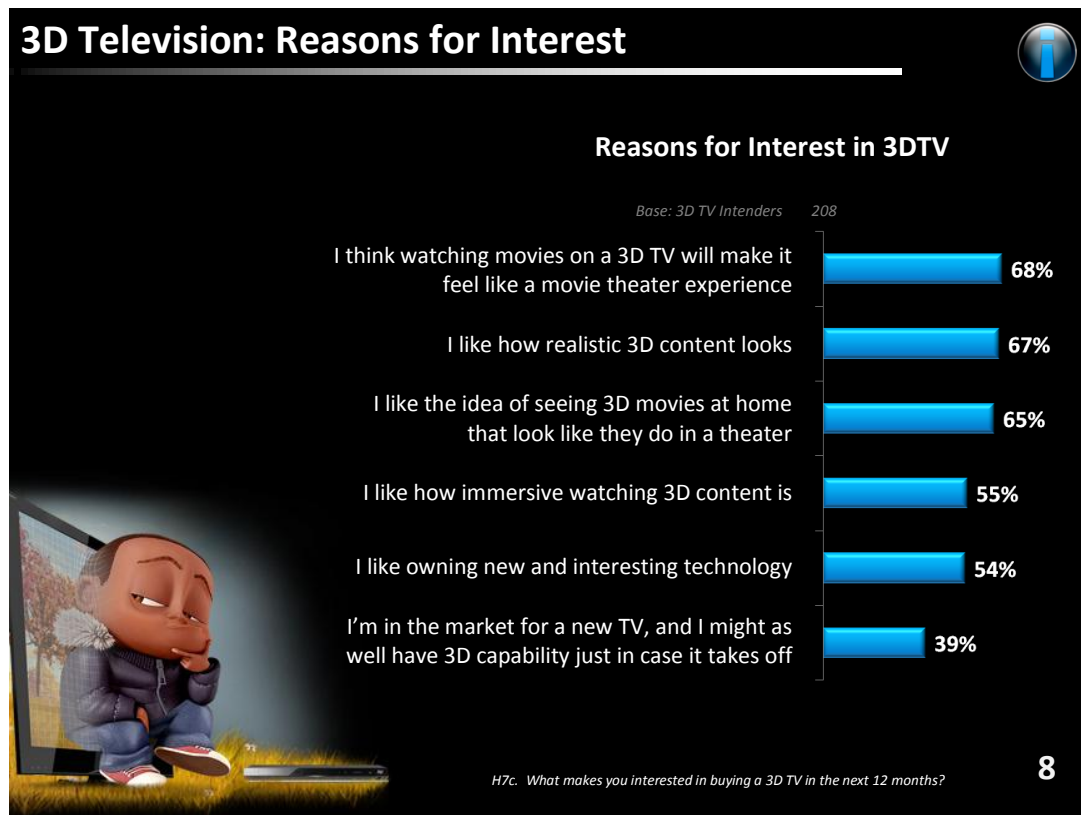
The report also suggests that following a period of slow and steady growth as the market established itself and accumulates a base of content and devices including both TVs and Blu-ray players, the 3DTV market will begin to take off in 2013 and shipments of 3DTV sets will approach 50 million in 2015.

ABI Research interestingly also identifies the popularity of 3D movies as a primary growth driver and not 3D broadcasting. AVSDA is of the view that both have their role to play in driving uptake of the hardware needed for both the software and broadcasting to be successful: somewhat of a classic chicken or the egg tale. The submission comments on this further in the next section.

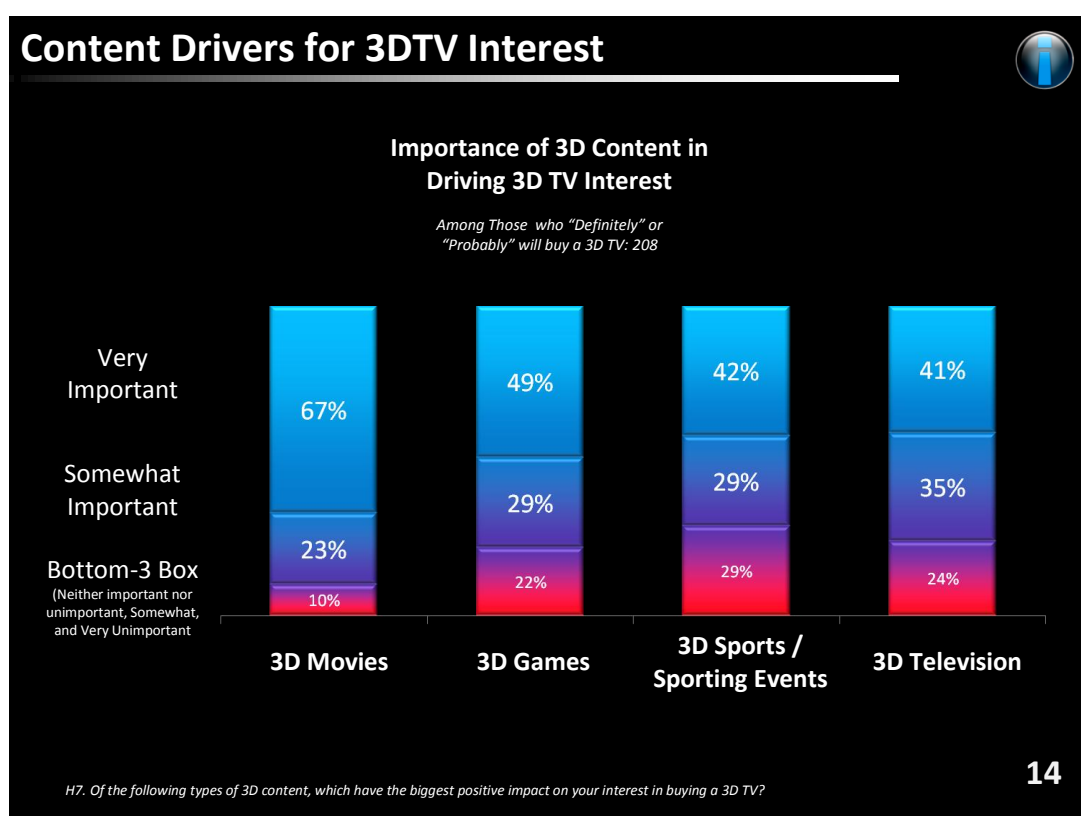
Consumer value proposition of 3DTV:

Consumers are excited by 3DTV when they experience first-hand the immersive qualities it can provide. The world-wide theatrical success of the film *Avatar* on 3D is evidence of this as is the response from Hollywood Studios in rushing to film and produce content on 3D.

Research organisation Interpret asked consumers what they value in 3DTV and the main reason was for watching 3D films (68%).



What is also interesting is Interpret also asked consumers what they saw as the content drivers for purchasing a 3DTV and the overwhelming response was 67% saw 3D movies as 'very important' compared to only 42% for sporting events.



AVSDA believes that it will be 3D movies that will drive mass adoption and the ultimate success of 3DTV but live sport broadcasting will play an important early adopter role in promoting the technology and driving early interest. Major sporting events, and the broadcasting of them in 3D, provides a way for broadcasters to product differentiate themselves from their competition, drive viewer or subscriber numbers or ask for a premium for the service (if a subscription or pay per view service).

Future content availability as a driver of demand:

Question 3 specifically asks for feedback on the future availability of 3D content. Clearly sport is currently being used by broadcasters to promote 3D broadcasting in its infancy but as new 3D filmed content becomes available on BD it will shortly thereafter likely be available to broadcasters. In fact, AVSDA believes that it will be quality filmed content that will drive 3D broadcasting in the future.

To date, content owners have confirmed 29 3D titles for BD in the US so far. These include 17 US studio feature films available to early 3D adopters. Eight Imax titles have also been confirmed for 2010. AVSDA believes that these titles will also be made available to Australian consumers.

Attachment A to this submission shows a more detailed title list of 3D BD content to being produced which demonstrates a steady and increasingly flow of quality 3D content.

4. The ACMA welcomes comments on other aspects of 3D TV, including any observations on the different environments presented by satellite and cable delivery, as well as the application of 3D technology in motion pictures, DVDs, Blu-ray and computer games.

This is an important question to ask and largely has been dealt with in the earlier section titled “Defining 3D”. However, the limitation of bandwidth and the current HD infrastructure will limit the quality of 3D broadcasting to 720p. This should be noted by ACMA and it should encourage the highest possible quality of content available to Australian consumers through 1080i.

Presumably fibre optic connectivity to the home and other high bandwidth broadband offerings will enable 3D IPTV capabilities in the future. It is again worth noting that the panel manufacturers are making their 3D sets to be able to be directly connected to the internet.

Conclusion:

AVSDA believes that the ACMA should promote the growth of 3D broadcasting in Australia. 3D broadcasting in the next few years will sit as a premium offering to subscription based TV services that can offer exclusive 3D channels while the free-to-air networks will likely cherry pick major sporting events and are unlikely to offer any exclusive 3DTV channels.

Like the transition from standard definition (SD) to high definition (HD), the introduction of 3D presents the broadcasters with another capacity problem in that the bandwidth of their networks is fixed but the bandwidth required for a single 3D channel is higher than that needed to transmit the same channel in 2D. In general this means that if the broadcaster wants to introduce a 3D channel then the bandwidth allocated to the existing channels must be reduced. Because this is unlikely the implication is that video compression will be required to deliver a 3D HD channel using the bandwidth originally envisaged for a 2D HD channel or that additional spectrum needs to be allocated.

North American and most European markets now offer over 20 exclusive 3DTV channels with 80 per cent of these offering live sports content¹. There will be a major gap of content availability outside these sports broadcasts, a gap which 3D films will fill and which research shows will drive the mass adoption of 3DTV.

Currently there are 25 BD 3D titles available and 60 3D cinema releases scheduled so content is available and will be in increasing numbers as the major studios invest heavily in 3D.

The advent of IPTV and its future adoption is something to also consider; especially so given the Australian Government's investment in a high speed broadband network in the NBN. A NBN will allow the proliferation of IPTV directly via the TV. Most if not all 3D TV panels sold in Australia, as well as all high end panels, have internet connectivity built in to the panel.

Thus IPTV and the NBN combined will allow in the near future high data streams such as 3D movies directly into the lounge room circumventing the traditional broadcast models of free-to-air TV. If film and TV piracy is allowed to remain unchecked then this will undermine not only the significant 3DTV investments but also broadcasting more generally in Australia.

It is an exciting time for this new technology for the home and something that the ACMA can help promote and facilitate or Australia risks becoming a laggard in the adoption of 3DTV and in creating protections for content owners and broadcasters.

¹ Source: ScreenDigest Presentation "3D market drivers from cinema to the home", 15 September 2010.

Attachment A:

Below is a table listing many of the titles due for production or release in the next two years. This is not an official list put together by members as the major studios usually don't commit to release dates more than 6-10 months out so the list should act as a guide only (source: www.film-releases.com).

Moomins and the Comet Chase	Fall 2010
Alice in Wonderland	March 5, 2010
Hubble 3D	March 19, 2010
How to Train Your Dragon	March 26, 2010
Clash of the Titans	April 1, 2010
Kenny Chesney: Summer in 3D	April 21, 2010
Shrek Forever After	May 21, 2010
Toy Story 3	June 18, 2010
The Last Airbender	July 1, 2010
Despicable Me	July 9, 2010
Cats & Dogs: the Revenge of Kitty Galore	July 30, 2010
Step Up 3D	August 6, 2010
Piranha 3-D	August 20, 2010
Resident Evil: Afterlife	September 10, 2010
Alpha and Omega	September 17, 2010
Legend of the Guardians: the Owls of Ga'Hoole	September 24, 2010
My Soul to Take	October 8, 2010
Jackass 3D	October 15, 2010
Saw 3D	October 29, 2010
MegaMind	November 5, 2010
Harry Potter and the Deathly Hallows: Part 1	November 19, 2010
Nutmcracker in 3D	November 24, 2010
Tangled	November 24, 2010
The Chronicles of Narnia: the Voyage of the Dawn Treader	December 10, 2010
Yogi Bear	December 17, 2010
TRON: Legacy	December 17, 2010
Cave of Forgotten Dreams	2011
A Monster in Paris	2011
XXX: the Return of Xander Cage	2011
Beauty and the Beast	2011
The Green Hornet	January 14, 2011
Sanctum	February 4, 2011
Untitled Justin Bieber 3d Project	February 11, 2011
Drive Angry	February 11, 2011

<u>Mars Needs Moms!</u>	<u>March 11, 2011</u>
<u>Sucker Punch!</u>	<u>March 25, 2011</u>
<u>Rio</u>	<u>April 8, 2011</u>
<u>Thor</u>	<u>May 6, 2011</u>
<u>Priest</u>	<u>May 13, 2011</u>
<u>Pirates of the Caribbean: on Stranger Tides</u>	<u>May 20, 2011</u>
<u>Kung Fu Panda: the Kaboom of Doom</u>	<u>May 26, 2011</u>
<u>The Green Lantern</u>	<u>June 17, 2011</u>
<u>Cars 2</u>	<u>June 24, 2011</u>
<u>Harry Potter and the Deathly Hallows: Part 2</u>	<u>July 15, 2011</u>
<u>Captain America: the First Avenger</u>	<u>July 22, 2011</u>
<u>Smurfs 3D</u>	<u>August 3, 2011</u>
<u>The Darkest Hour in 3-D</u>	<u>August 5, 2011</u>
<u>Spy Kids 4: All the Time in the World</u>	<u>August 19, 2011</u>
<u>5nal Destination</u>	<u>August 26, 2011</u>
<u>Dolphin Tale 3D</u>	<u>September 16, 2011</u>
<u>Journey 2: the Mysterious Island</u>	<u>September 23, 2011</u>
<u>The Three Musketeers 3D</u>	<u>October 14, 2011</u>
<u>Contagion</u>	<u>October 21, 2011</u>
<u>Puss in Boots</u>	<u>November 4, 2011</u>
<u>Happy Feet 2 in 3D</u>	<u>November 18, 2011</u>
<u>Arthur Christmas</u>	<u>November 23, 2011</u>
<u>Hugo Cabret</u>	<u>December 9, 2011</u>
<u>Alvin and the Chipmunks: Chip-Wrecked</u>	<u>December 16, 2011</u>
<u>The Adventures of Tintin: Secret of the Unicorn</u>	<u>December 23, 2011</u>
<u>Newt</u>	<u>Summer 2012</u>
<u>Clash of the Titans 2</u>	<u>Spring 2012</u>
<u>Stretch Armstrong</u>	<u>2012</u>
<u>Godzilla</u>	<u>2012</u>
<u>Frankenweenie</u>	<u>March 9, 2012</u>
<u>The Croods</u>	<u>March 30, 2012</u>
<u>Madagascar 3</u>	<u>May 18, 2012</u>
<u>Men in Black 3</u>	<u>May 25, 2012</u>
<u>Brave</u>	<u>June 15, 2012</u>
<u>Untitled Spider-man Reboot</u>	<u>July 3, 2012</u>
<u>Untitled Batman Project</u>	<u>July 20, 2012</u>
<u>Hotel Transylvania</u>	<u>September 21, 2012</u>
<u>Monsters Inc. 2</u>	<u>November 2, 2012</u>
<u>The Guardians</u>	<u>November 21, 2012</u>