SPECIAL REPORT

CONSUMER LIFESTYLE TECHNOLOGIES

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ENABLING BROADCAST 3D TV

The stakes and possibilities of 3D broadcasting, enabled by Sisvel Technology's "Tile Format"

Paolo D'Amato
CEO, Sisvel Technology

Jim Chabin

President, International 3D Society

Davide Ferri

Business Development Manager, Sisvel Technology

SISVEL TECHNOLOGY

The Missing Link

Sisvel Technology's Tile Format works toward spanning the delivery gap for 3D

EDITOR'S NOTE

Richard Barnes
Editor-in-chief
Cleverdis

Australian-born Richard Barnes has worked at a high level in media around the world for over 30 years, in top radio, television and print organizations. In 2000, he took on the role of Editor-in-Chief at Cleverdis, responsible for overseeing content of all international publications. To this end, Barnes is in close contact with the world's biggest electronics manufacturers (such as Philips, Panasonic, Sony, Samsung, etc.). Barnes is also Editor-in-Chief of IFA International, the official international daily of IFA Berlin – the biggest consumer lifestyle tradeshow in the world, and for Consumer lifestyle News (cln-online.org) – Europe's Consumer lifestyle Industry hub.

In a wave that began with Avatar, energising and motivating TV manufacturers to make their devices 3D-capable, we have seen a massive movement towards enabling such technology in the home. The result of this movement has been a major rise in investment in 3D production capacity, which nevertheless is still in its early days.

Thus, on the one hand, we have producers starting to pump-out 3D content, and on the other, an increasing number of consumers buying 3D-capable TVs. But how does one deliver the content? Initially, we have seen the onset of 3D Blu-ray Discs, and the arrival of "Over The Top" services via the Internet, which can each be likened to "vessels" delivering content "one at a time" to the end destination. But what about building a bridge, and making 3D content available to the masses via broadcast TV? That's more of a challenge.

For the delivery of 3D content, broadcasters need to keep costs to a minimum, when it comes to studio infrastructure, and also when it comes to paying for broadcast bandwidth or channels. They also need to use a system that allows people who are not equipped with 3D sets to watch 2D exactly as they would have before.

At Cleverdis, in our role as "industry radar", we have been scanning the horizon, and today have the pleasure of highlighting a technology which we believe will greatly enhance and facilitate the onset of broadcast 3D around the world.

In the following pages, you will have the chance to discover the workings of the "3D Tile Format" (and its technical eco-system) - the fruits of an exceptionally creative and innovative Italian player, Sisvel Technology. Whether you are a broadcaster, a manufacturer, or an industry analyst interested in 3D, we trust you will find the content of this SPECIAL*report* of great value and worth.

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Stable Technologies in an Unstable Market

While the road ahead for 3D TV is hazy, the technology supporting it is sure and solid

Paolo D'Amato
CEO,
Sisvel Technology

D'Amato holds a cum laude MA in Electronic Engineering. Following a long career at RAI he became a consultant for several companies. In 2004 he was appointed CEO of Sisvel S.p.A. and in 2008 he founded Sisvel Technology s.r.l. He holds more than thirty patents and is the author of more than one hundred articles covering TV and Teletext technologies.

In today's market, one has to be honest and say it is impossible to predict, with any certainty, the future of the 3D TV broadcast market.

What is sure is that many movies are now being shot in 3D and many are being converted into 3D, especially animations. A number of animations made in the past will eventually be converted into 3D, and the market for 3D films and cinema is assured.

I have no doubt that this movement will migrate to the small screen; however setting a time line is impossible. One can however predict that as time goes on, as more content is made available, and as the trend to selling "3D capable" TVs picks up pace, the pressure on broadcasters to provide 3D programs will increase.

In the future, there will most likely be a blend of 3D and 2D programs – all in High Definition. Production in-house will also see a little of both, but not only 3D. This is due to the way people watch TV. Watching a film, documentary or sporting event in 3D is an immersive experience, not something one can do while washing the dishes or dusting the shelves. In other words, 3D TV is happening, and broadcasters will have to address the issue if they are not to be left behind by Blu-ray Discs or OTT (Other The Top) Internet-based media.

Those who will thrive will need to establish a complete 3D TV chain. To be successful, broadcasters need to pick up the baton and run with it, as do set-top box vendors and TV manufacturers.

In Italy, broadcasters in Turin and Tuscany have begun trials of the Tile Format system, and we believe that as more content comes online, combined with local 3D production by the participating broadcasters, which they will be able to share among themselves thanks to a "shared syndication" idea we are promoting, there will be adequate 3D material for the establishment of a solid market.

The advantages of the 3D Tile Format in bandwidth efficiency, picture quality, and backwards compatibility with 2D are so strong that any broadcaster currently operating in 3D, or considering a 3D service, is putting Sisvel Technology at the top of the must-see list.

Sisvel Technology is dedicated to pushing 3D broadcast technology in the right direction. We are in this for the long haul and we are working towards bringing together the true leaders of the industry into a 3D broadcast eco-system that will stand up to the tests of time.

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DISPLAYSEARCH
AN NPD GROUP COMPANY

3D: From Novelty to Maturity

Broadcasters begin to set the ball rolling in a promising market

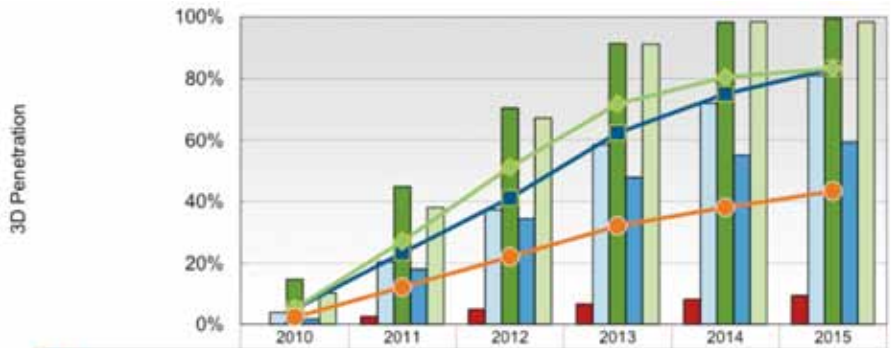
By Paul Gray - Director TV Electronics & Europe TV Research

Paul Gray
Director TV Electronics
& Europe TV Research,
DisplaySearch

While the hype stage of 3D is drawing to a close, 2011 saw 3D products reaching mass-market price points. We are now on the point of rapid shipment growth.

3D TV services are appearing all over the world, including emerging markets as far afield as Peru. It is a clear lesson how new technology propagates rapidly in the digital world, with Chinese TV set makers for example already manufacturing sets in their home market.

We expect that 3D will continue to expand in set makers' product ranges. 3D will become 45% of total TV shipments in Western Europe, and 30% of Eastern Europe in 2015. Of course in the popular sizes for the main TV set (40" and up) penetration will be much higher, and the relative lag for 3D in Eastern Europe is largely caused by the region's preference for smaller sizes, in particular 32". In fact, in 40" and larger sizes, more 3D sets than 2D are forecast to ship in 2012 for Western Europe and 2013 in Eastern Europe.



	2010	2011	2012	2013	2014	2015
30"-39" LCD	0%	2%	5%	7%	8%	9%
40"-49" LCD	4%	20%	37%	58%	72%	81%
50"+ LCD	15%	45%	70%	91%	98%	100%
40"-49" PDP	2%	18%	34%	48%	55%	59%
50"+ PDP	10%	38%	67%	91%	98%	98%
LCD (40"+)	5%	23%	41%	62%	75%	83%
PDP (40"+)	5%	27%	51%	72%	80%	83%
LCD+PDP Total (30"+)	2%	12%	22%	32%	38%	43%

Source: Q3'11 Quarterly Advanced Global TV Shipment and Forecast Report - Frame Rate + LED + 3D

3D BROADCASTING IN EUROPE

Of course people watch programmes, not televisions! It is pointless to consider 3D without the material to support it. While broadcasters have rushed to launch some form of 3D service, either as treats like major sports events or longer thematic channels, there remains a severe shortage of content to watch. Even today, including all the 3D movies ever made, there would not be enough to fill a single 3D channel. Broadcasters have therefore started to commission special programming to supplement movies and sports coverage. Such commissions are typically documentaries as they probably carry the most impact in 3D – wildlife and adventure footage is more dramatic than comedy. So far, 3D transmissions have largely been on satellite, which has been able readily to provide the extra capacity. Pay-TV providers also need to offer more than their free to air competition, and 3D fits nicely. Terrestrial broadcasting remains constrained by a shortage of radio spectrum, as in most countries analogue transmission is still switching off. Terrestrial broadcasters also have to fight to retain space against competing demands such as mobile communications. However, new broadcasting techniques such as service-compatible coding allow a single 720p HD broadcast with the extra 3D view cleverly packed in the transmission. A 2D set sees only a normal 2D broadcast. This technique is already being tested in Italy, and the second launch of a 3D 'service-compatible' channel in that country shows that 3D is beginning to appear on terrestrial services. This uses the Sisvel Technology tiled approach. Longer-term, it should allow a way for 3D to appear in terrestrial TV for special occasions. Spectrum allocation will determine how much 3D will be available, with European governments keen to auction as much spectrum as possible to reduce deficits.

The TV Manufacturer's Point of View

Vestel partners with Sisvel Technology as the first manufacturer to include Tile Format technology in 3D sets

The R&D groups of TV and STB manufacturer Vestel were among the first to enable 3D technology on TV along with other strong brands in the market. The brand prides itself on the implementation of decoder technologies corresponding to the latest standards, with its R&D division totalling 600 engineers. We asked Vestel Foreign Trade's President, Turan Erdogan, to outline his group's development work with Sisvel Technology.

Vestel's R&D group, in close collaboration with Sisvel Technology, has implemented Sisvel Technology's Tile Format decoding (or re-formatting) and completed "productization" on top of our current 3D-TV platform. Vestel 3D-TV is the first real time platform supporting video streams encoded in Tile Format for better 3D video quality. Vestel and Sisvel Technology jointly demonstrated this technology at IFA 2011 in Berlin.

What do you feel are the advantages of Sisvel Technology's Tile Format?

3D technology first came up with side-by-side and top-and-bottom frame-compatible formats in order to make use of the existing broadcasting infrastructure. Naturally there are flaws with these technologies, the most prominent one is the loss of resolution on either vertical or horizontal axis. Sisvel Technology's Tile Format on the other hand allows us to minimize effects of compressing two images into a single frame. Sisvel Technology's Tile Format keeps the aspect ratio of the content, which degrades negative effects of up-scaling. Furthermore, former non-3D televisions can use the same video stream to display the content in 2D without any user intervention (backward compatible). Backward compatibility is an important feature for a foreseeable future where 2D and 3D content will coexist. With the existing 3D formats the user is required to manually switch the TV to 3D mode. Sisvel Technology's Tile Format, when it becomes part of the standard, will provide solution to enable seamless switch to 3D mode when the corresponding format is detected. Advantages for broadcasters are obvious. With Sisvel Technology's Tile Format, only one channel can be used to transmit both 3D and 2D 720p HD video. This way, broadcasters can save bandwidth and the other extra costs for the extra channel.

Do you feel that broadcast 3D will become important in the next years? If so, to what extent?

It usually takes new technologies quite a while to be mainstream but considering 3D, there is no doubt that it has already been welcomed by the general public. This trend will continue with a fast pace, as stereo cameras, stereo encoding/decoding techniques and standards mature, not forgetting also the stereo literacy of people behind the cameras.

Will 3D broadcasting totally replace or surpass 2D?

I don't think so. Instead it will take the role of ubiquitous companion of 2D, leaving the choice to viewer depending on the environment, ambiance and the mood.

Turan Erdogan
President,
Vestel Foreign Trade

Born 20th February, 1955, Turan Erdogan graduated with a B.Sc in Mechanical Engineering from Istanbul Technical University in 1976 and an M.Sc. in Production Management from Brunel University in London in 1980. Mr Erdogan held a number of managerial positions in Turkish companies over a number of years. In 1988, he took on the role of President, Vestel Foreign Trade, a role he has held since that time. Mr Erdogan is an Executive Board Member of DIGITALEUROPE and is VP of the Electronic Manufacturers Association of Turkey.

More information: **www.vestel.com.tr**

> *Former non-3D televisions can use the same video stream to display the content in 2D without any user intervention*

Leading the 3D Charge

Much like the onset of HD TV a decade ago, 3D TV is now sure to happen… What's the roadmap?

The International 3D Society is at the heart of the 3D eco-system, and is working to move the industry in the "right" direction. It was founded to advance the art and technologies of 3D content and foster the industry's professional innovators. The organization is presided by former "Emmys" President, Jim Chabin. Who better to give a vision of which way the 3D TV industry is headed?

Jim Chabin
President, International
3D Society

Jim Chabin has been President of the International 3D Society since September 2008. Prior to this, he worked as President and CEO of Promax for many years, and from January 1999 through December 2002 he was President and CEO of the Academy of Television Arts and Sciences. In the early 90's Chabin was VP, national promotion and corporate development for E! Entertainment Television.

More information:
www.international3dsociety.com

We have to begin with the backstop, which is the fact that 3D cinema continues to be very successful worldwide, with premium ticket pricing continuing to generate important revenues for the cinema industry. The breath-taking production, "Hugo" opened recently in the US and around the world, and 75% of the tickets sold were in 3D. So you see very encouraging signs from the cinema, which is an excellent precursor to the broadcast discussion. In China, the government recently announced that its new five-year plan includes one 3D channel to be up and airing on January 1, 2012 with six hours of programming a day, and TEN new 3D channels within five years. 3D broadcasting is happening in Japan, and the 3D production community there is creating some spectacular content, as is now also the case in Korea. We now have content creators getting up to speed and being able to start to fill a 3D pipeline for television.

What is your outlook for the number of stations running 3D content looking five years down the road?

Right now we are tracking about 40-45 different organizations worldwide that are publically stating they are going to have 3D on the air or that they are producing 3D. That number will not grow too fast in the short term, as they're busy just trying to fill up that content pipeline, but this will build to the point that we will have a critical mass of 3D content that is viewable, exciting and compelling, moving through the global distribution pipeline. If we were looking out five years, I would say that those figures would therefore probably double to around one hundred.

We are also seeing a facilitating of the broadcast process by companies such as Sisvel Technology, who have developed the Tile Format – to broadcast 3D and 2D on the same channel. Surely this will help matters as well?

Yes. We had the initial technological breakthrough, which was the flat screen that can show 3D content in the home, and we had the original content creators saying, "*We have the content that can go on these platforms*". What is needed is a killer app. The killer app in this case is that I want to be able to walk into my living room and turn on my TV set and if that's a 3D program it will be in 3D. If it's a 2D program it will be in 2D. Companies such as Sisvel Technology are vital, because they are making 3D something that is consumer and broadcaster friendly. Enhancing the consumer experience in this way is just as critical as the creation of the platform or the content itself.

> *Companies such as Sisvel Technology are vital, because they are making 3D something that is consumer and broadcaster friendly*

The Technical Challenge

Tile Format 3D broadcasting is arriving at a stage where rollout is imminent

Over the past two years Sisvel Technology has been working on the ideal method of packing and transporting video in 3D format. At the centre of this development is Giovanni Ballocca, Digital TV Project Manager at Sisvel Technology. We asked Mr Ballocca just where he's up to in the development of the Tile Format.

We have been putting our efforts into pushing the technology forward within the international standardisation bodies; mainly the DBV and the MPEG video-encoding group. This has been coupled with the actually development of technology trials. We have active services running by satellite with continental coverage in Europe, and several terrestrial trials in Italy. Pilots are also being discussed in other parts of the world, particularly in Asia but also in the USA.

How did you come upon this particular technology?

The idea is simple. We came to it mainly thanks to the 30-year experience of our boss, Paolo d'Amato, who was working for many years with RAI, particularly in the field of production. He is very aware of the main issues in television content production, and he was willing to focus our work on the application of 3D technologies within the production infrastructure. From this point of view, the Tile Format has a number of key advantages. Compared to side-by-side or top-and-bottom, the Tile Format allows the broadcaster to distribute video with better quality. There are already some existing technologies that might allow the distribution of full-resolution 3D TV. But in that case, it can be complicated for the broadcaster. Take the example of multi-view coding, which is one of the technologies being considered for the next phase of the standard. In that case, you have to carry several independent video contributions that need to be synchronised. You also have to install new forms of wiring within the production and broadcasting infrastructures.

In the case of the Tile Format, we have better resolution and video quality, but we are using infrastructure that already exists between the cameras and the distribution head end. This is quite an advantage, because the adoption of different technologies might imply huge investments from the broadcaster, for deploying something that may be used for producing a couple of hours of content per week.

How do the broadcasters feel about this new technology?

Smaller broadcasters have been concerned when they see the massive investments made by companies like BskyB in order to run football in 3D. Seeing something like this, which is complex and expensive, can be quite scary for them. But when they realise they can produce documentaries and interviews in 3D without too much fuss, and distribute them using the tile system, enabling the use of just one HD channel, this is something they see as doable and even quite exciting.

Even small broadcasters can start broadcasting some 3D content and get excellent results.

Giovanni Ballocca
Digital TV Project Manager,
Sisvel Technology

Giovanni Ballocca is graduated in physics at the Università di Torino in 1995. Since 2003 he has been the technical manager of DTVLab at CSP, leading all the activities in the field of digital broadcasting (design and development of MHP applications, IP over DVB services, DVB-T/H testbed deployment). He has precedently worked in the fields of GRID computing and web technologies (semantic web, XML technologies, web mining). He has been involved as a technical member in the regional and national task forces in charge of the planning and implementation of the analog switchoff.

Even small broadcasters can start broadcasting some 3D content and get excellent results

EBU•UER

THE ROAD TO A STANDARD

The European Broadcasting Union (EBU) is the "guiding light" when it comes to setting new broadcast standards... But how is the organisation anticipating the onset of 3D via broadcast channels? We put the question to David Wood, EBU Deputy Director, Technology and Development...

3DTV can be very effective, but it is worth remembering that it is built on HDTV. The left and right images need to be shot in HDTV, and broadcasting needs an HDTV channel, at least for our first generation 3DTV system, the Frame Compatible. So you need HDTV production facilities. Many of our members are just at the beginning or are in the middle of a transition to HDTV, so the HD transition has to be higher up the priority list than 3D. A number of members are trying out "island" 3DTV production (as they did in the past to try out HDTV production). We are also contributing fully to the standardisation of 3DTV systems - which is needed now for those who have the capacity to broadcast 3DTV. Whether you must have a system that allows existing HDTV set top boxes (or IRD) to be used, or whether you can foresee a new HDTV set top box (or IRD) is the critical factor here. It seems that an attractive broadcast system for those who do not have a large population of HDTV set top boxes, such as our German broadcaster members, would be a 'Service Compatible' system which provides HDTV-level 3DTV and a serviceable 2D picture as well for those who need it.

More information: **www.ebu.ch**

SES
your satellite company

Broadcasting 3D content across Europe

SES builds a strong neighborhood for 3D content via satellite

Luxembourg-based satellite operator SES is the leading platform for 3D broadcasts in Europe. Working closely with broadcasters and industry partners such as Sisvel Technology, SES has spearheaded the roll-out of 3D television across the continent. Pietro Guerrieri, General Manager of SES Italy explains how the satellite operator sees the future of 3D broadcasting.

SES today broadcasts more than ten 3D channels in Europe featuring a variety of premium content from operators such as SKY in the UK and Germany, Canal+ in France and Viasat in Scandinavia. It also carries pan-European channels such as Brava3D, High TV 3D and Penthouse 3D building a strong neighborhood for 3D content on its satellite fleet. Working closely with its broadcasting customers and various industry players such as Sisvel Technology, Samsung and Dolby, SES has been at the forefront of introducing 3D TV as a premium layer of television in Europe.

As a neutral technical service provider, we see ourselves as an enabler for broadcasting 3D television across Europe and have taken various initiatives to support 3D. These include a cooperation with Sisvel Technology in Italy to offer broadcasters the opportunity to test 3D broadcasts using the Tile Format supported by Sisvel Technology, but also other formats including "top and bottom" or "side-by-side" and Dolby's Full HD format.

SES has also launched 3D demo channels helping the consumer electronics industry and retailers to market 3D television sets to consumers. By working with industry partners such as iPont, SES has helped driving the development of broadcasting technology and consumer equipment for 3D. As an integral part of the DVB forum, SES is keen on establishing a broadcasting standard for European 3D broadcasts.

Pietro Guerrieri
General Manager, SES Italy

Pietro Guerrieri joined SES in 2010 as General Manager for Italy. He has more than twenty years of experience in the satellite industry. Before joining SES, Pietro was CEO of Milano Teleport and worked for Eutelsat in various positions. Pietro holds an MBA from the ESSEC Business School in Paris and a degree in Aeronautical Sciences.
More information: **www.ses.com**

What are the main constraints for broadcasters who want to run content in 3D?

If you look at the variety of content that is now available via our satellite fleet and the impressive number of more than one million screens that have been sold in Europe, I think it is obvious that 3D TV is gaining momentum in Europe. Due to the higher costs for the production of 3D television content we do however believe that 3D television will remain for some time a premium layer of television that will be mainly offered by pay-TV operators. Smaller operators who do not have the means to re-finance the costs for 3D will more likely focus their 3D activities on broadcasting live-events in order to differentiate themselves from competing video channels such as OTT.

Embracing the 3D Tile Format with a View to New Business

Italian regional TV network Quartarete pioneers regular 3D broadcasts using Sisvel Technology's innovative technique

The Italian regional network Quartarete, based in Turin, was the first station in the world to start regular broadcasts using the 3D Tile Format. Close-up on an early success story...

Davide Boscaini
Managing Director,
Quartarete

Davide Boscaini was in at the start of Italy's independent TV revolution in 1979. He is Co-Founder and Managing Director of Quartarete and has been instrumental in establishing the network as the Piedmont region's principle regional broadcaster. He describes his role as helping to develop regional TV in Italy from its hobby status in the early days to the major industry that it is today. Boscaini's achievements have been in the technical area, recognising the importance of innovation to stay one step ahead of competitors by helping to deliver a superior quality service to viewers.

More information:
www.quartarete.tv

Based in Turin, and running 1979, Quartarete covers the entire Piedmont region in northwest Italy. In November 2010, they launched a full 3D service. "*We have always looked to the future and been early adopters*," says Quartarete Managing Director Davide Boscaini. "*We were the first regional station in Italy to broadcast in colour and the first to start Digital Terrestrial TV transmissions. In 2008, the EBU approached us to broadcast an experimental channel in 3D for four days to coincide with a conference in Turin. We met SISVEL founder Roberto Dini and he showed us the immense possibilities of using the 3D Tile Format*."

After that successful experiment in 2008, further meetings with Sisvel Technology led to the launch of the first regular channel using the 3D Tile Format on 30th November 2010. "*The main reason that we adopted Sisvel Technology's 3D Tile Format is because of its retro-compatibility with 2D sets. Then there is the superior picture definition. This can easily be seen by comparing the picture quality of our 3D programmes with those of the networks that use the Side-by-Side format. That technology is now 15 years old,*" says Boscaini.

Quartarete's daily 3D broadcasts include documentaries and events including sport and music. "*3D is proving especially effective for tele-sales including real estate,*" says Boscaini who says that producing for 3D has meant a rapid learning curve for his production team. "*You have to forget 2D production values and the 5 camera studio. Watching a 3D programme is like looking at a window on the world... a much more relaxing experience*."

In its first year, Quartarete's 3D broadcasts have been monitored by a 200-strong panel with decoders for the 3D Tile Format. Whilst still in its pioneering days, Boscaini is convinced of the future for both 3D TV and Sisvel Technology's 3D Tile Format. "*Although there is a limited number of viewers with 3D decoders at the moment, HD TV set sales have been massive and thanks to the retro-compatibility of Sisvel Technology's 3D Tile Format, 3D programmes also look great on HD TV sets. I wouldn't have embraced 3D transmissions and the 3D Tile Format if I didn't believe there was a market for it. Adopting new technology is a great way to generate business, and as for using the 3D Tile Format, you just have to look at the superior picture quality*."

> *The main reason that we adopted Sisvel Technology's 3D Tile Format is because of its retro-compatibility with 2D sets.*

The Business Case for 3D TV

Sisvel Technology's business development specialist, Davide Ferri outlines the stakes of the onset of the Tile Format

The success or otherwise of "occasional" 3D programming on terrestrial, cable, and even satellite TV networks will depend upon the vision and action of TV and STB manufacturers in the coming year. Davide Ferri is at the heart of Sisvel Technology's effort to motivate and empower the eco-system…

Davide Ferri
Business Development Manager,
Sisvel Technology

Davide Ferri obtained a degree in Computer Engineering. He joined CSP Innovazione nelle ICT in 2000, working in the research and development department. In February 2002 he joined the Security Laboratory of CSP as Mobile Security analyst. From 2005 to 2010, he was in the «Innovation and technology transfer department" in CSP, acting as Technology transfer manager. In September 2010 he was appointed Business Development Manager at Sisvel Technology.

"We have to project what will be useful for the industry to have in the next years.

My main task is to try to address the commercial aspects of the format. It's not so simple, because our business model is indirect. Our orientation is not to sell the format to just anyone, but to present the technology in such a way as to convince the market that it is good enough to be used by broadcasters all over the world. In order to reach this target, we need to follow different commercial routes. One is that we have to attend all the international standardisation bodies, where the task is to explain, from the technical point of view, how the technology works and what its advantages are, because each group has two facets: the commercial side and the technology side. Broadcasters, set top box manufacturers and TV manufacturers all have certain commercial requirements. In other words, we have to project what will be useful for the industry to have in the next years.

The Tile Format is frame compatible, which means it is able to use broadcasters' existing HD infrastructure. It is also backward compatible. This mean the broadcaster has the possibility to use a single channel to broadcast 3D content and also reach the 2D user. It saves bandwidth and therefore saves money. Unfortunately it is not sufficient to explain all this by words or demos. This means we need broadcasters that really test our technology, using it on air, to evaluate the advantages and disadvantages. We need the main TV and Set Top Box manufacturers to include in their equipment the firmware that is able to decode our technology. To motivate them, we need to instigate more trials with broadcasters. TV and Set Top Box manufacturers, along with the international standards committees, need to clearly see that we are not alone; that our technology is already used by broadcasters, and also that the industry is ready to put on the market equipment that uses this technology.

What we are asking TV and STB makers is to add the format to the future TV and STB sets, on top of other 3D formats such as side-by-side and top-and-bottom (which are already included in the TVs).

It means that we will give broadcasters the chance to use whatever format they prefer – side-by-side, top-and-bottom or Tile Format. It is simply a question of upgrading the software for the TVs, which will not be a major investment for the manufacturers. In this respect, we can support them with all the technical details they need in order to address the software development.

Conclusion

Gerard Lefebvre, President, Cleverdis

It is vital for the entire TV broadcast industry to prepare itself with the most efficient systems of delivery available

Gérard Lefebvre

President, Cleverdis

The history of TV development and marketing has only seen four really major developments. The first of course was the arrival of colour, the second and third were recent, and concurrent, with the arrival of digital broadcasting and High Definition (the latter enabled by the former), and of course the latest is the arrival of 3D. Much as we saw with the arrival of HD, the onset of 3D is having, and will have *"growing pains"*, as we go through *"chicken and egg"* cycles. Much as happened with HD, as the mass of TVs with HD capability reached a critical level, the rest (content production and distribution) followed suit. Currently, TV manufacturers are all adding 3D capability, and within a couple of years, most TVs sold will be 3D capable. That critical mass will again be reached, at which point broadcasters who are ready to deliver content (which will also follow suit when TV critical mass is reached – just like HD) will surf a new wave of success, just like HD stations now. It is therefore vital for the entire TV broadcast industry to prepare itself for this moment in time with the most efficient systems of delivery available. In the past, the senior management of Sisvel Technology has been responsible for the invention of some industry-changing technologies (such as automatic channel set-up and on-screen display, etc). We believe that today this will again be the case with their "clever" Tile Format 3D broadcast system.

In simple terms, regarding 3D broadcasting: *"It will happen. Get it right. Work with the right people"*. This will be critical to the success of the sector.

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