SPECIAL REPORT

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A NEW PERSPECTIVE ON 3D BROADCASTING

Combining the strengths of top industry players to solve key issues in the dissemination of quality 3D images

Gian Antonio Pancot
CEO - Sisvel SpA

Maurizio Cini

President & CEO, SIM2 Multimedia S.p.A.

Francesca Damato

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SISVEL TECHNOLOGY

An Unwavering Belief in the Future

The creation and nurturing of a 3D TV eco-system – Vital to the future of this complex, but promising market

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.

We all see life in 3D... but the idea of expanding our dimensions in the virtual world of TV is still in its infancy.

As display resolution (particularly pixel pitch) gets finer, the experience of viewing 3D at home on the living room TV is arriving at a point of being very attractive for consumers. There are still, however, a few stumbling blocks to the success of 3D TV. Firstly, many channels are still not even broadcasting in HD.

Secondly, there is still too little good 3D content available to make dedicated channels or program segments. And thirdly, the means of broadcasting and receiving 3D signals has been clumsy. Overall, this creates the same kind of "chicken or egg" problem as had been the case for HD TV some years ago...not enough available content, difficult and expensive to broadcast, and not enough consumers with compatible sets... meaning content producers stayed with the "old methods," and thus the wheel went around.

Only the brave, and those with a firm, strong and unwavering belief in the future make the giant steps necessary to break that vicious circle. Today, one such company, Sisvel, has invested a great deal of R&D in creating a broadcast technique that ensures HD quality 3D images for those watching at home, without increasing bandwidth.
But that was not enough. Sisvel's management realized that the only way to move things forward was to help create an environment or eco-system in which all this could work. Today, they have brought in partners to assist in the development of two critical components of the eco-system: a "3D Village" – a grouping of content owners and producers, finally allowing for a 3D content pool of high quality 3D content; and, thanks to a development partnership with Sim2 Multimedia, an "all-in-one" set top box allowing consumers to receive not only broadcast 3D content, but also creating a unique "Smart TV" environment.

This SPECIAL *report* takes you on a tour of this new 3D eco-system. Enjoy the ride!

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CONTENT

Fostering True Innovation

Gian Antonio Pancot - CEO - Sisvel SpA highlights his Group's commitment to bringing new and innovative technology to the consumer electronics market

Throughout its growth and development, Sisvel has always monitored the rapid changes of the global market and the opportunities it has offered, characterised by strong competition and integration.

At the beginning of 2008, Sisvel foresaw the necessity to create a new entity by exploiting the knowledge and abilities developed within the company in previous years. Sisvel Technology was founded as a subsidiary of Sisvel, with the purpose of exploiting the group's extensive technical experience in the consumer electronics market, in particular with the aim of implementing R&D programmes, developing intellectual property assets with potential market value, as well as assisting partners in defining geographical patenting policies based on manufacturer/consumer market trends and in co-sponsoring R&D programmes.

Thanks to the initial experience gained through working with standardisation bodies, a specific department was created with the purpose of coordinating research and development in the specific technological fields of home entertainment, mobile telephony, indoor and outdoor localisation, green technology and intelligent transport systems.

In the past four years, Sisvel Technology's team has been further strengthened with highly qualified professionals, allowing the coordination of important R&D projects with local and international entities. This includes the cooperation with: CSP - Innovation in ICT, a renowned local research centre of which Sisvel is also a shareholder; RAI CRIT (Centro Ricerche e Innovazione Tecnologica RAI), the national broadcaster's research centre; IRT Munich (Institut für Rundfunktechnik); the University of Turin; the Polytechnic of Turin; the Istituto Superiore Mario Boella – ISMB, an entity operating inside the Polytechnic of Turin and Top-ix (Turin Piedmont Internet Exchange). Our strategic plan has led to the creation of a structure in which research and development represents the focal point of the company's mission. Its success is assured thanks to its qualified team focused on achieving important results.

With this philosophy in mind, Sisvel Technology developed the 3D Tile Format project. Sisvel Technology is now coordinating and promoting this project with the support of its main partners with which it regularly takes part in all major international trade fairs.

Sisvel Technology's partners have been involved in all stages of the entire chain, from product testing to manufacturing. This requires a regular exchange of information and experiences; as well as close contact with various standardisation bodies, manufacturers and the market itself.

With this new challenge, Sisvel, the sole proprietor of Sisvel Technology, aims to put the "inventive loop" concept into action, to valorise IP rights, and thus to protect and consolidate the results of its intensive research.

Sisvel has been involved in the consumer electronics field for 30 years and on several occasions has confirmed its interest in TV technology, starting point of its history which will be soon object of a new publication. In fact, it is convinced that research results will soon be successful, based on the fact that only the most innovative technologies will have a positive outcome on the market.

Gian Antonio Pancot
CEO,
Sisvel SpA

Gian Antonio Pancot is the CEO of Sisvel Spa. He joined the Sisvel Group in, 2007 after almost 30 years of experience in the field of Intellectual Property Rights. From 1978 to 1992 he was the CEO of one of Italy's leading patent and trademark companies. Subsequently, Mr. Pancot moved to Rome where he worked with another leading patent and trademark firm until assuming his present position with the Sisvel Group.

"(...) research and development represents the focal point of the company's mission (...)

3D TV - How Much and When?

The EBU and DVB – creating standards for 3D TV

David Wood
Chairman of ITU-R WP6C

David Wood is widely recognised as an authority in the broadcasting industry, and has picked up many honours throughout his career. He is the chairman of the World Broadcasting Unions Technical Committee, and has authored more than 100 technical papers, articles and book chapters on diverse subjects. He played a leading role in establishing the ITU Recommendations, which today form the basis of the world's digital television standards.

More information:
www.ebu.ch

Dr David Wood is known throughout the industry as being at the spearhead of the EBU's policy making when it comes to getting 3D TV from source to screen. We asked David how he sees the current state of play... and the future.

3D has always been an enigma. You see it, and you think 'wow'- that will be fantastically popular. But predicting the roll out rate is difficult, because there are so many factors at play. One thing is proven by the fact that it has had regular periods of being 'in fashion' over many past decades - there is an underlying and unstoppable desire by the public for 3D. We just have to get the context and the content right. We are doing all we can to put the best technology in place, and there is some really superb 3D content around, like the 3D Hugo; or, for example, the BBC's 3DTV Olympic opening ceremony. It's clear that it does have, and will have, a place in the media landscape. What remains to be seen is how much and when.

> *We are creating all the tools that broadcasters need to broadcast 3DTV*

The delivery of 3D content via broadcast means continues to be a bugbear. How do you think this will pan out over time?
You can lead a horse to the water. In the DVB Project we are leading the broadcasters to the water. Sisvel is of course a very active DVB member. We are creating all the tools that broadcasters need to broadcast 3DTV. We began with the 'Frame Compatible' or FC format, which suited pay TV operators. The DVB FC format is now the world's most used broadcast 3DTV format. Following that we just developed the 'Service Compatible' or SC format, which will suit broadcasters who want full resolution pictures, and also want 2D HDTV sets to see a 'normal' 2D HDTV picture. Next year we should have a specification for extending the resolution of an FC system. So, soon everything will be there for broadcasters and 3DTV. They need to pick up the baton and run with it.

What happens when we look beyond the 3DTV technology we have today?
The hot one today is whether a glasses-free system can be developed that would make use of the next generation of displays ('4k'), which will have 8 Mega-pixel pictures. There would now be scope for 'multiple-view' pictures that could be seen without glasses. Fantastic! The multiple-views could be generated from two transmitted views, or possibly we could broadcast separately the different views. This is really the cutting edge of 3DTV today. Come back next year for an answer. Apart from that of course, we need to think about how 3DTV will fare in the presence of 'ultra high definition television', which will of itself have higher quality non-binocular depth cues. What an exciting future!

Driving 3D Uptake

Use Nintendo Video 3DS and 3DS XL to teach, inform and entertain

Francesca Damato, Business Development Specialist for Nintendo Italy, is tasked with finding 3D content that appeals to everyone from ages 8-88...

Francesca Damato
Business Development Specialist
Nintendo Italy

In June 2011 we launched Nintendo Video which is app-based and pushes out new 3D content every week. Because our consoles are used by such a broad audience, we try to find series and clips that appeal to everyone, and that last from between 1' 30" up to a maximum of 7'. Most of what we distribute is native 3D content, but we do occasionally include some conversions which are a mixture of material that producers have already made or in some cases, we will commission companies to produce for us. That is how the Luca Toni Football Academy and the Make-Up Academy were made for the Italian market. We specified what sort of target audience we were after and then these 7 installments of a series (with each installment running three minutes). We are also working on a series with Sisvel called Puppy Dog, which includes 15 episodes, each one covering a different breed of dog and how best to raise them.

I'm delighted that Quartarete, 50Canale and several other Italian broadcasters have expressed their willingness to create a 3D content pool

How is sourcing appropriate 3D material progressing? Is it getting easier?

When I started this job 18 months ago it was not easy to find content, especially of the right quality. And even now, perhaps because 3D channels in Italy are quite rare, we find that there are not many companies producing content. One reason is the expense, but another is the fact that the demand for 3D content is still low in Italy, and indeed the rest of Europe. That's why I'm delighted that Quartarete, 50Canale and several other Italian broadcasters have expressed their willingness to create a 3D content pool, which will allow members to share content. I hope this idea will make it more widely available, because that's exactly what 3D needs.

What are the most popular clips and series on Nintendo Video?

Movie trailers generally are very popular, and our Academy series also did very well in Italy. We recently offered several episodes of Maga Animation's Acqua in Bocca in 3D and that also proved very popular. We are also moving forward with content for more mature audiences.

3D TILE FORMAT BY SISVEL TECHNOLOGY

On 1 March, 2012, CANALE 50, the most popular broadcasters in Pisa (Italy), and among the most important in the local area, started testing an unencrypted 3D channel. This project was initiated using the 3D Tile Format developed by Sisvel Technology.

The 3D Tile Format was chosen because of the improved quality of its format over available alternatives, allowing those members of the audience with a 3D screen and a Set Top Box to enjoy stereoscopic viewing. Additionally, because the format is backwards compatible, viewers with 2D HD screens can watch the same programmes in high definition. The technology is very convenient for the broadcaster, because it does not have to use increased bandwidth to transmit signals in 3D.

The 3D channel will be broadcast 24 hours a day throughout Tuscany and CANALE 50 will be showing all of its best documentaries on the channel covering subjects including old Italian villages, folk events, scientific discoveries, sports and much more.

"All productions will be part of the 3D content syndication project promoted by Sisvel Technology and will be open to all content providers with the intent of promoting 3D technology and the 3D Tile Format," Canale 50 CEO Nicola Rossi says. *"Canale 50's business objective is to provide its audience with the best selection of programmes*

and real-time information possible. The introduction of this new technology will help us to fulfill this objective and also contribute to a better working environment for employees, technicians and consultants. This 3D project is a challenge that Canale 50 will tackle with fresh ideas, professional training and the creative skills of its operators and directors."

Technology Explained

How does Sisvel Technology's 3D Tile Format work?

Franco Visintin

International Consultant - Communication Technologies

Dr Franco Visintin is a graduate in telecommunications engineering from the State University of Rome. From 1961, he served RAI-Radiotelevisione Italiana where in 1987 he was appointed Chief Engineer of the Technical Department of the TV Production Center in Milan. From 1990 to 1993 he held the position of Deputy General Director of the EEIG (European Economic Interest Grouping) "Vision 1250", operating for the European promotion of High Definition Television. In 1995 he retired from RAI after 34 years with the company. In the same year he joined IBC (International Broadcasting Convention) where he was appointed Chairman of the "Nombre d'Or" Widescreen Festival, holding this position until its last 2001 edition. He is currently operating as an international consultant in the field of communication technologies.

When broadcasting 3D TV, two times more information has to be processed than before in order to create the two separate images, creating much greater demands on bandwidth.

We asked industry expert Franco Visintin what the key issues are and how they are solved with Sisvel Technology's Tile Format.

Originally, the way two images were sent in order to create a 3D image on a TV was done by "squeezing" the images vertically or horizontally, putting them side-by-side (as had been done for 3D cinema) or top and bottom, and then "un-squeezing" them on the TV. By doing so, resolution is halved in one of the axes. For many reasons, TV broadcasters have mainly been using the side-by-side (left and right) system.

The second issue has been in trying to find a system that could be compatible with 2D receivers, allowing people with 2D TVs to watch a program transmitted in 3D. The question thus arose as to how to solve these problems. The 3D Tile Format solves both problems, because it permits the insertion, in a unique 1080 line, high definition frame, two 720-line pictures. The left picture remains whole, while the right picture is cut into three parts, which are called "tiles." When the images arrive at their destination, they are reassembled into a high-definition 3D format. At the same time, ordinary 2D receivers are able to receive just the left hand image without any problems.

The 3D Tile Format allows broadcasters to transmit a single service for 2D and 3D audiences. Consumers with 3D equipment can fully enjoy a 3D viewing experience while consumers with traditional 2D TV sets will appreciate the service in 2D. The 3D signal is identical to an HDTV signal, and therefore it can travel along the existing TV distribution infrastructure and does not require special equipment. The Format, based on a 1080p signal, results in two 720p "HDReady" images, and does not suffer from the imbalance between

3D frame packing format ▸
2D decoded image ▾

The 3D Tile Format allows broadcasters to transmit a single service for 2D and 3D audiences

horizontal and vertical resolutions as one finds with the "top and bottom" or "side by side" methods. Moreover the squeezing process is replaced by a much safer remapping process which eliminates image degradation problems.

What are some of the other strong points of the new format?

Key benefits of 3D tiling are quality and backward compatibility. But another factor which can't be ignored is the fact that due to the way the Tile Format works – that is to say with the left "whole" image and the right split into three – there remains a blank space in the bottom right hand corner of the broadcast image. This unused band space can be used to send metadata or other signals to the end user, and this has generated a lot of interest from broadcasters.

This could include such things as a depth map, useful to properly allocate in the 3D space locally generated graphics (menus, EPG) or sub-titles. When graphics are generated at the receiving end, proper location in space is essential for viewer comfort, and in the future users may manually control the picture depth, enhancing or reducing the 3D effect, based on subjective preferences. Those are three major advantages!

How do you see the future of 3D TV?

The television industry is always looking to the future. In the 80's we were studying and testing analogue, and later high definition digital television. Now, high definition is broadly adopted, and standard definition will little by little disappear. High definition will become the norm and from this time forward we will see two new trends: one will be oriented towards 3D and the other will be towards ultra high definition. As these trends continue, the possibilities will become very exciting!

The Home's "Visual Com

Sim2 Multimedia teams with Sisvel to create TeleWeb Uno – the first

Maurizio Cini
President and CEO,
SIM2 Multimedia S.p.A.

Maurizio Cini is President & CEO of SIM2 Multimedia S.p.A and Sole Director of Finsim Srl and President of BV Srl.
He was born in Udine, Italy in 1952, and lives in Pordenone. He is married and has two children.

More information:
www.sim2.it

While Sim2 is known by many in Europe for its home cinema projectors and displays (now 3D compatible), the company was one of the first, well over a decade ago, to introduce digital decoders and recorders to the market.
Now, in cooperation with Sisvel, they have developed a veritable "Swiss Army Knife" in an STB. We asked Sim2 President and CEO, Maurizio Cini about his company's background with Sisvel in the development of 3D TV broadcast solutions.

Our relationship with Sisvel and its founder, Mr Dini, has lasted for many years. Just recently, we have been working together on the creation of a receiver and recorder able to manage the Tile Format developed by Sisvel Technology. This format is very interesting for the market, but was also the last to come onto the scene, so it needs support and a strong push.

How did you come up with the idea of your new set top box the Tele Web Uno, which is a combination of many features in one package?
In the beginning, we were just looking to create a receiver for the Tile Format, so we were mostly working on that. We brought in some additional focus groups working around the system itself as well – with the features people might want in such a box, and we realized we needed to make a set top box that would cater for a number of new services, rather than just one. TeleWeb, which is a name we trademarked many years ago, is a way to stay connected with all services, and it is future-proof; not only for 3D in all its formats, but also with Internet connection and a media player where the user can view their own photos and movies.
The idea was to create the "visual communication heart" for the home. This is thus not just a decoder suitable for a few applications, but the real center of the electronic environment in the home.

munication Heart”

all-in-one STB including Tile Format decoding

What is so good about the Tile Format?
One of the reasons that 3D has not been as popular as we had projected is because the video quality was not really perfect and the first products on the market created a negative perception of technology. With a growing number of titles available in 3D – though never enough – quality and performance needed to be improved and the Tile Format will be critical to having 3D as a standard in many homes because it ensures a very efficient, high quality image and will create a more attractive 3D proposition for consumers.

How will this product be rolling out in Europe?
We will start in Italy at the end of September, mostly through the consumer channel. We will then be pushing it into many other markets where we are actively present. Apart from specific requests for distribution in the Far East due to the arrival of the Tile Format there, our intention is to go on to develop business in the UK and continental Europe, with a focus on France and Germany. The product needs to be customized country by country, to adapt to local services. This means that a new software platform capable of managing the various region-specific services has to be developed.

Will you be marketing the product or do you expect retailers to push it for you?
We are going to push this product very hard, starting at IFA and through November, when we will kick-off a big push through broadcasters and to specialized media. The product will be distributed primarily through brown goods consumer channels, mainly in areas where the Tile Format is available.

What are the three key selling points?
The top three are, firstly, the fact that the STB is compatible with virtually any transmission format. It can receive basically anything from anywhere. The second point is that consumers can record, manage and organize the content according to their preference. Lastly, you can receive not only broadcasts in the 3D Tile Format, but also many other new transmission systems. This is important, given the rumors of new features and formats arriving on the market.

What is the feedback so far about this product?
In the current tough economic climate, on the one hand, retailers are hesitant to try something totally untested, but by the same token they are also looking for something new and exciting to offer their customers. The perception of the product is that it is a major innovation, so there is a very positive expectation that it will succeed. However, the reaction varies somewhat from one distributor to another. The more specialized they are, where they think they can create added value through a new product or platform, the more interest there is in the product. Overall, I am seeing a very positive attitude towards this new product.

> *This is thus not just a decoder suitable for a few applications, but the real centre of the electronic environment in the home.*

◂ New Set Top Box

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.

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**

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.

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

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.

What better way to assure the future than to invest in it - in no uncertain terms?

Conclusion by Gerard Lefebvre, President, Cleverdis

Thanks to companies like Sisvel, the future of 3D broadcasting is assured.

Gérard Lefebvre
President, Cleverdis

Roberto Dini, who founded Sisvel a number of years ago, has been "the spark" that began several key technologies that we still use today, such as the automatic channel finder launched by a TV when it is turned on for the first time, or some of a television's onscreen display features, such as the volume bar, we use every day.

Much like some of the industrial greats of the past, he has instilled success not solely through his own ideas and labor, but by surrounding himself with highly competent "ideas" people of a similar ilk and with harmonious hopes and aspirations.

To this end, when Dini's team came up with the 3D TV Tile Format, they realized that much more was needed than just developing the basic technological concept. Through experience, and with a clear vision of the market, Sisvel has been working at the heart of the TV industry to develop strong partnerships and create a 3D eco-system that will help foster strong and sustainable market growth.

3D TV is undoubtedly here and will be an increasingly important part of the media landscape. What is not yet certain is how soon and how fast the market will flourish. We thus take our hats off again to Roberto and his team for having not only developed a very clever technological solution to the 3D broadcast problem, but also for having the marketing savvy to create and promote the eco-system that must go with it.

Thanks to companies like Sisvel, the future of 3D broadcasting is assured.

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SISVEL TECHNOLOGY

WE CREATE IDEAS

SISVEL TECHNOLOGY OFFERS A WEALTH OF BENEFITS.

Thanks to its 3D TIle Format and its successful collaboration with national and international broadcasters, Sisvel Technology is able to offer its partners numerous advantages: better 3D resolution, increased bandwidth efficiency (support for both 2D and 3D viewers in a single channel) and a rapidly expanding catalogue of 3D content.

www.sisveltechnology.com
www.3dt.it