

Document	Description	Author/Date
TDVision comparison White Papers.	Explains TDVision technology comparing versus other 3D companies	MRGN/Feb 06.

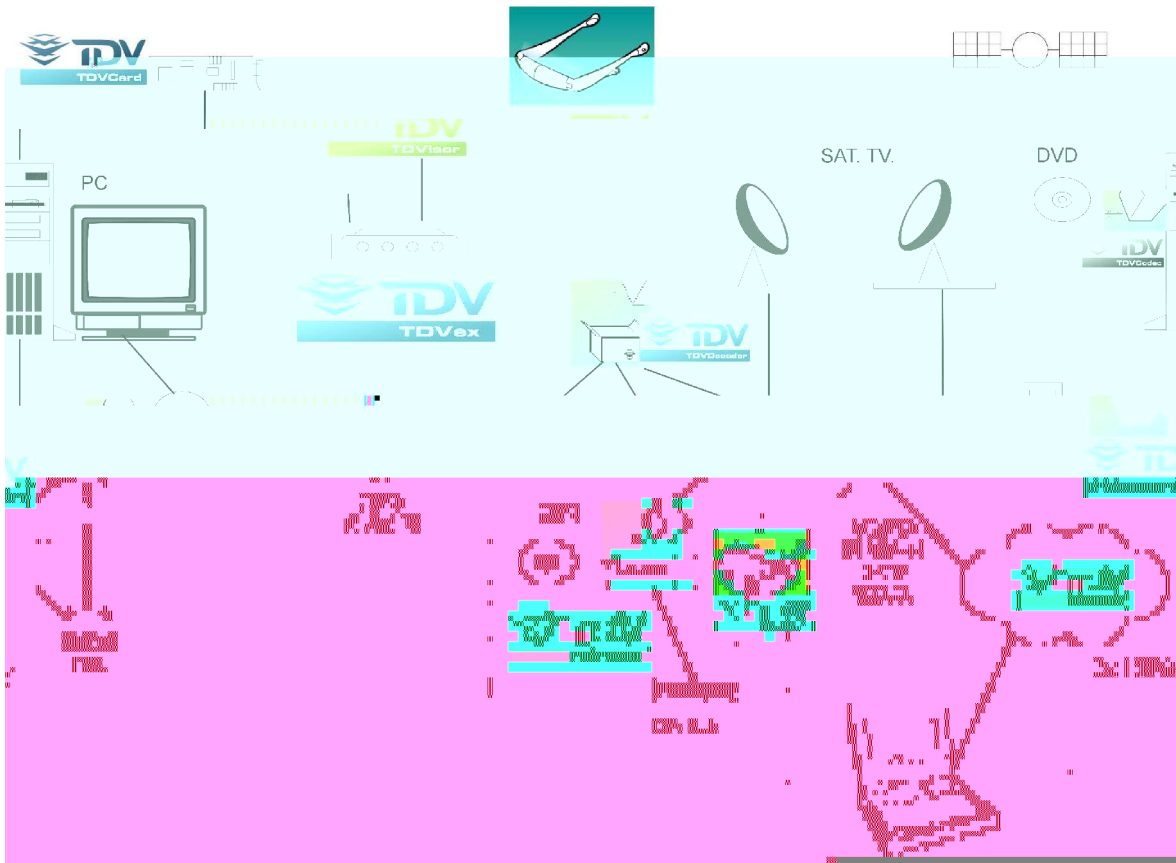
Objective: To mention the key differences of our technology and how this differences make TDVision's technology an active part of the digital convergence like no other 3D company as of today.

Here we can see a bidimensional technology map showing the different technologies out there in the market.

Contents of this document:

- TDVision technology map
- Comparison chart
- Comparison Map
- Description of other technologies

TDVision technology map:



As we can see, TDVision's technology works in different layers:

- Display layer
- Decoding layer
- Transmission, storage and deploy layer
- Processing and encoding layer
- Acquisition layer

TDVision has created all the software, hardware, firmware and interfaces to integrate a completely different 3D infrastructure that can simultaneously display 2D and 3D, deploy over current 2D infrastructures and present in true 3D emulation.

All the other technologies work in only one layer of the technology map.

In particular, I-O systems only works on the Display layer and has no active participation in other layers.

Comparison Sheet

	TDVision	Red/Blue Polarization (Spykids 3-D)	Shutter Glasses like Barco/Vrco systems	Vertical/Horizontal Polarization (Chicken Little 3-D)	Auto-Stereoscopic like Sharp3d laptop and ddd, Samsung 3-D cellphone	Other Stereoscopic (3d field sequential 3d interlaced like i-o systems, Emagin, Icuiti)
3-D Content	Image uses two displays, one for each eye (stereoscopic)	Image is created by polarizing two cameras lens with red and blue color	Image is sent to the screen and needs the shutter glasses (active multiplexing or polarizer and alternates quickly between right and left	Image is generated through filtering content with vertical and horizontal lines	Image is a layered filter (lenticular lens over TV monitor screen & eye views image at angle	This technique divides the full frame in either vertical or horizontal even and odd lines i.e. assigning the even or left and odd or right.
Eye Apparel	Viewer uses a TDVISOR	Viewer is required to wear red/blue glasses to filter image	Viewer needs shutter glasses to view 3-D	Viewers need visor to separate images	no visor	Viewer is required to wear a visor
Needs a Monitor/TV	NOT NECESSARY (optional)	-es. 3-D video production is required to view. The simultaneous projection of both images (red and blue) is required.	-es. needs an external device with specific refresh rate.	-es. must view an external projection white screen & can not be projected on a TV monitor & as light is required to be polarized.	-es. TV monitors must be modified & all existing monitors are useless for this display technology.	no.

Comparison Sheet

<p>Side Effects</p>	<p>NONE</p>	<p>Various including' Oeadaches)lurred vision (estricted length o# time to wear glasses</p>	<p>Various including' Oeadaches 1atigue a#ter prolonged use (*2 minutes 3xtensive stress in the eye and brain. Double vision.</p>	<p>Various including' Oeadaches 1atigue 1orces)rain to interpret images 3xtensive stress in the eye and brain.</p>	<p>3yes need to be at prede#ined distances and angles+ typically at 45 inches #rom screen and 6%+ * degree viewing angle. Can not see entire image in true *+D& (two planes& #ront plane and rear plane . , ot conducive to multiple viewers. 3xpensive.</p>	<p>Various including' Oeadaches 1atigue 3xtensive stress in the eye and brain. Double vision)lurry 1lic"ering.</p>
<p>Resolution</p>	<p>HDTV Equivalent to 72" Plasma TV</p>	<p>(esolution is the same as the content& but there is a severe distortion without glasses& and considerable di#ference with the glasses on (all red& all blue leading to loss in color.</p>	<p>7oor resolution Image distorted Double vision)lurry (eduction in 1rame (ate and #lic"ering.</p>	<p>(esolution could be very high& but without glasses yields double vision.</p>	<p>7oor resolution (cuts the resolution by hal#& yielding 4' 8& 4' * or 4' 8.* resolution ratio</p>	<p>7oor resolution as original image resolution is divided by 8& * or 8.*. 9ctual image is : ; ; x5 ; ; unless the even and the odd portions are duplicated which yields a loss o# in#ormation.</p>

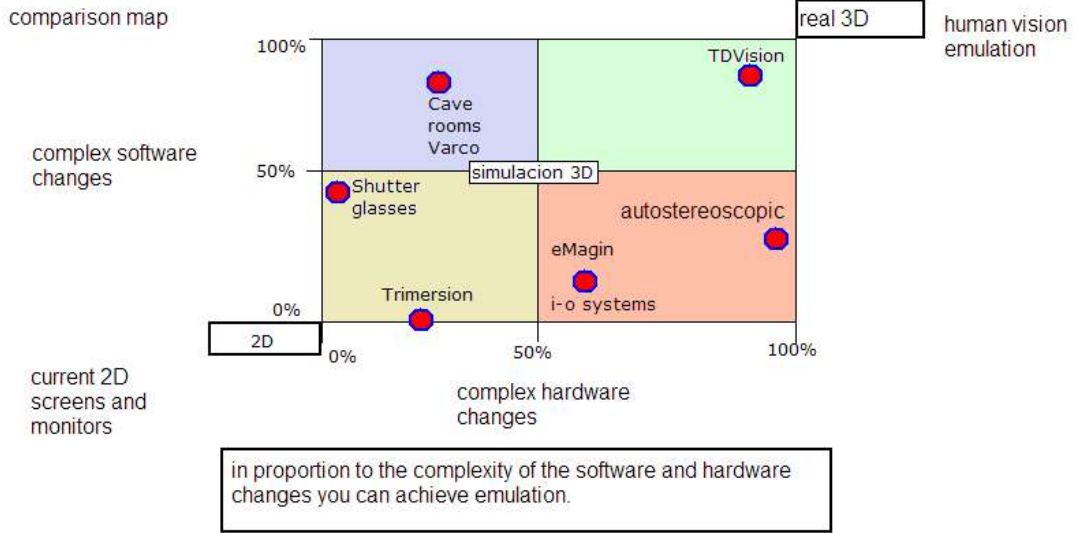
Comparison Sheet

<p>Simultaneous 2-D and 3-D</p>	<p>YES. Simultaneous viewing in 2-D and 3-D is capable with no loss in frame rate or resolution of either image.</p>	<p>, o. Content can not be viewed with the original resolution once it is converted.</p>	<p>, o. Content can not be viewed with the original resolution once it is converted.</p>	<p>, o. Content can not be viewed with the original resolution once it is converted.</p>	<p>, o</p>	<p>, o. Content can not be viewed with the original resolution once it is converted.</p>
<p>View with others</p>	<p>YES. Multiple TDVisor's are required or others can view the traditional 2-D TV/monitor/screen</p>	<p>YES. /ultiple red and blue glasses are required< the traditional 8+D TV%monitor%screen image is distorted not allowing viewing without the red%blue glasses.</p>	<p>YES. /ultiple shutter glasses are required< the traditional 8+D TV%monitor%screen image is distorted not allowing viewing without the shutter glasses..</p>	<p>YES. /ultiple polarized glasses are required< the traditional 8+D TV%monitor%screen image is distorted not allowing viewing without the polarized glasses.</p>	<p>NO. The limited viewing angle and required distance #rom screen prohibits multiple viewers.</p>	<p>YES. /ultiple visors are required< the traditional 8+D TV%monitor%screen image is distorted not allowing viewing without the polarized glasses.</p>
<p>Versatile Applications</p>	<p>YES PC, Video, military, Wireless Streaming, Video Games, DVD, TV, Homeland Security</p>	<p>, o</p>	<p>, ot compatible with current systems</p>	<p>, o only #or theatre and cinema.</p>	<p>, o</p>	<p>, o</p>
<p>Cost</p>	<p>Mid at viewer side and mid-high at production side</p>	<p>\$ow at the viewer side& high at the production side</p>	<p>/id at viewer side /id+Oigh at production side</p>	<p>\$ow at viewer side Oigh at projection time</p>	<p>Oigh</p>	<p>Oigh</p>
<p>Portable</p>	<p>Yes</p>	<p>, o (required monitor</p>	<p>, o (required monitor</p>	<p>, o (required large projection screen and professional camera</p>	<p>, o</p>	<p>-es</p>

Comparison Sheet

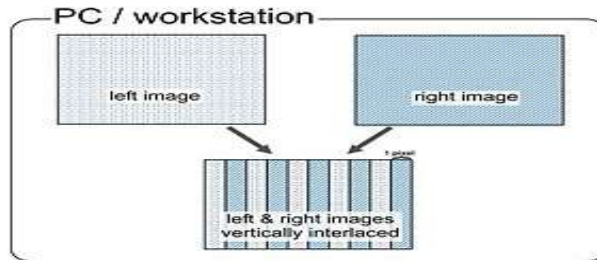
<p>Platform independent</p>	<p>Yes. Can run in 2-D without any modification and runs in 3-D for "TDVision enabled software and hardware" without adversely affecting the original content.</p>	<p>, o. (e! uires special production. = or"s only #or *+D content. >nce content is converted to this #ormat& can only be viewed with this technology.</p>	<p>, o. (e! uires special hardware and so#tware. = or"s only #or *+D content. >nce content is converted to this #ormat& can only be viewed with this technology.</p>	<p>, o. (e! uires changes on production and so#tware multiplexing. = or"s only #or *D content. >nce content is converted to this #ormat& can only be viewed with this technology.</p>	<p>, o. (e! uires changes on so#tware and hardware. >nce content is converted to this #ormat& can only be viewed with this technology.</p>	<p>, o. (e! uires changes on so#tware and hardware. >nce content is converted to this #ormat& can only be viewed with this technology.</p>
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COMPARISON MAP



DESCRIPTION OF OTHER TECHNOLOGIES

3D field sequential/3D interlaced: i-o systems / eMagin / Trimerision: This companies use their visors to display in 2D, if they want to display in 3D they need to use 3D Field sequential or 3D interlaced techniques. This techniques can be represented with the following diagram:



This affects the resolution (cuts by half the horizontal resolution) and has flickering and low frame rate.

The mentioned companies are only on the Display layer and do not have any participation or contribution to the Processing infrastructure.

Shutter glasses: a.

The USA patent is based on a method for displaying a 3D image, which is constructed from one right and one left frame each, on a display which is assigned at least by one separating device (shutter). This shutter always assigns frames of one image channel to each eye of the observer. Each frame is alternately displayed with the other frame as in each case presented on a TV display.

Video images are composed by sequences of frames. The USA patent alternates a left frame and a right frame on the same display, and uses a shutter (a lens that turns transparent or black alternating left and right synchronously for each left or right frame and blocking the other right or left eye to watch the external display)



Autostereoscopic: This technology is a monitor with a lens-in-a-film that divides the image in two different angles, It only displays 2 image planes (back plane and forth plane), giving a certain deep effect. This technology also requires a new monitor to be replaced. It produces poor resolution, due to the semi-cylinders mentioned before.

Cave Rooms / Varco / Barco: They use polarization glasses and require a big room to project with two projectors over a big white wall. The power processing needed to drive the image is depending on Silicon graphics workstations.