

# SUMMARY & RECOMMENDATIONS...

...ON 3D TECHNOLOGY AND THE MEDICAL ASPECTS

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# Too much bad 3D for opossum Heidi & Co.?



Source: [http://www.fun-insite.de/bild\\_view.php?bid=e22a81433](http://www.fun-insite.de/bild_view.php?bid=e22a81433)



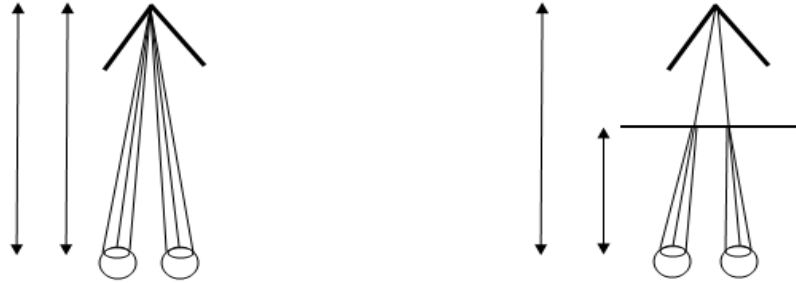
Source: [http://a1.blick.ch/img/gen/6/P/HB6PaHHJ\\_Pxgen\\_r\\_800x550.jpg](http://a1.blick.ch/img/gen/6/P/HB6PaHHJ_Pxgen_r_800x550.jpg)



Source: <http://www.deutscherwein.de/wp-content/uploads/2010/01/kopfschmerzen.jpg>

# Natural stereo viewing vs. 3D screens

- Copy principal of natural stereo viewing on technology



- Consequences: headache, fatigue eyes, neusea and some more
- 3D is not even two 2D images

**3D = (2 x 2D) + the human factor**

## What have we learned from the medical view?

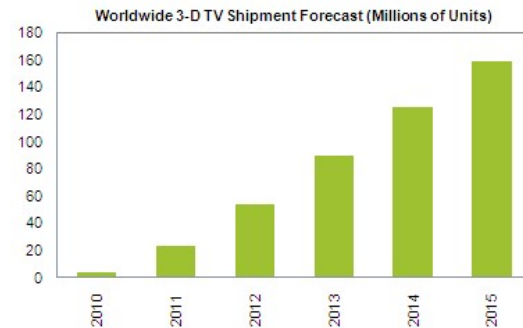
- We could decrease the percentage of people with physical problems while viewing S3D by probably 5% with a good technology
- We could decrease the percentage of people with physical problems while viewing S3D by probably 2-3% with a medical therapy

## What have we learned from the medical view?

- Medical experts are still divided over the impact of S3D on children
- Fast moving eyes in 2D ↔ low moving eyes in 3D
- Blood pressure
- Triple flash works well
- Usually one eye is stronger than the other

## 3D in figures...

- Approx. > 100 3D movies on the market
- Approx 1/5th of worldwide screens already in 3D
- Expected 3DTV sets sold in total in 2011: + ~460%



Source: IHS iSuppli Research, Juni 2011

# 3DTV business

- Comfortable 3D = money
  - 3D is already a very old « technology »
  - Today we improve 3D with the **digital** technology
  - S3D is an economical factor today
  - New devices are required (HDMI 1.4, 3DTV Setup, new STBs...)
- new investments for both sides (broadcaster and consumer)

# 3DTV business

- 3D should offer a unique viewing experience and not bombard the consumer 24h
- 3D as an additional feature by CE manufacturers
- Autostereoscopic displays probably not coming up very soon??
- Problems with logos → transparency for consumers missing



# 3D in practise

- Already very good practises
- Still needs to be improved
- Be creative



## 3D in practise

- 1% negative to 2% positive parallax
- Lens nightmare: iris, focus, zoom
- No two totally equal lenses in the world

# 3D home cinema

- Viewing distance:  
the normal distance for HD (3H) – 10%  
→ ~ 2.7H far from the screen
- Viewing duration:  
for the majority of people much less than 2D viewing, OK for a movie (~1,5h)  
only less have no reduction in the viewing duration  
3D glasses have an impact on the viewing duration

## 2D → 3D conversion as a universal solution?

- Archives are full of 2D → 2D to 3D converters are available, **but...**  
...results vary from quite good to very bad – depending on the shot composition of the original 2D picture

**There will be the same issue like up-converted SD for HD, it's  
(always) visible.**

## Some requirements

- ✓ Identify 3D image format(s) and mode(s)
  - ✓ 2D backwards compatible
- ✓ Use current hardware/software where possible
- ✓ Trend to transmit two full resolution images (L/R)
- ✓ Best cost-benefit-ratio between bandwidth and comfort/quality
  - ✓ Training and experience

## What do we need? – Some issues

- synchronization
- bandwidth
- standards
- infrastructure/workflow automation is still missing
- new STBs required for service compatible 3D or FCC (DVB)
- lacking/less knowledge of how to produce comfortable 3D content

## What do we need? – Some issues

- More comfortable content is required urgently
- Archiving
- Who says what good or bad S3D content is?
  - subjective evaluation: no methodology (ITU-R BT 500 for 2D) or reference display yet
- Vast number of logos should inform and not confuse consumers

## What do we need? – Some issues

- QoE improvement:
  - Depth tuning in post-production and in the home
  - 3D subtitling correct positioning in depth
  - Correct positioning in depth of graphics in STB and TV
  - Menus, EPG, Widgets,...
- 3D audio
- Try to get rid of 3D glasses
  - Autostereoscopic/Multiview displays
- Medical research



## With a wagging finger...

*We still need to be realistic and have to learn,  
but we are on a very good way to create comfortable 3D.*



*If stick to the rules,  
the content will become really comfortable  
and offer an immersive experience to the audience.*



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MEDIA TECHNOLOGY & INNOVATION



# Evaluation

Please fill in the evaluation sheets!

Thank you...

