Acquiring, Editing, Sharing, and Viewing 3D Videos: Our High Quality / Cost Effective Experience

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Introduction

Videos of surgical procedures have quickly become an important part of resident education. More recently, 3D video has gained popularity due to the added dimension of depth which is crucial in surgical education. The process of acquiring, editing, sharing, and watching 3D videos is difficult, expensive, with no uniform standards. We present our high quality / cost effective experience.

Methods

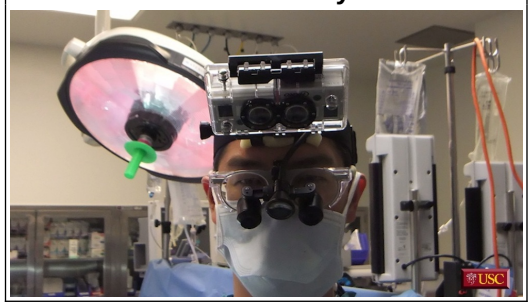
The authors have a background in commercial cinema and 3D production. We recommend a 3D workflow that uses low cost commercially available hardware and software with open formats, combined with free online services. Proprietary systems often are prohibitively expensive and can be a technological dead end.

Acquisition

-Stereoscopic 3D microscopes
- TrueVision
- Zeiss

-VisionSense stereoscopic endoscope
-Head-mounted GoPro Hero 3D system
- Lost cost
- 1080p high-definition
- Surgeon's point of view
- Low risk of contamination

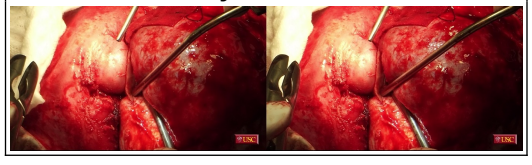
GoPro 3D Hero System



Editing

-Side-by-side 3D format
-Widely supported across editing programs and viewing platforms
-No synchronization problems
-Cuts horizontal resolution by half
-Easier than editing two separate streams

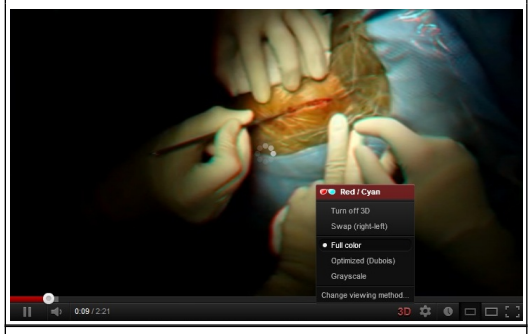
Side-by-side Format



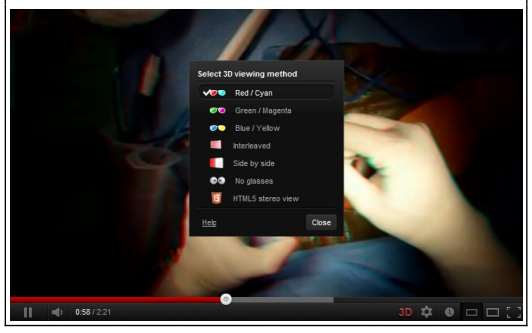
Sharing

-Youtube and Vimeo
-Both can display videos in multiple 3D display formats
-End user can adjust video to match viewing platform
-.264 codec in an MP4 container provides excellent quality with reasonable file sizes

Youtube 3D Controls



Youtube 3D Controls



Viewing

-Passive 3D televisions and monitors
-Low cost polarized glasses instead of expensive active shutter glasses
-Good for large groups
-Less cumbersome than active shutter glasses
-Much better than anaglyph (red/cyan)

Conclusions

3D video technology is quickly evolving and there are many competing standards on both the hardware and software front. Using widely commercially available hardware and open standards instead of closed proprietary system will allow for greater acceptance and use of this promising technology.

Learning Objectives

By the conclusion of this session, participants should be able to understand how to effectively use stereoscopic 3D for resident education.

References

Sample 3D video clips:
http://youtu.be/iCaSM1VyBlQ