

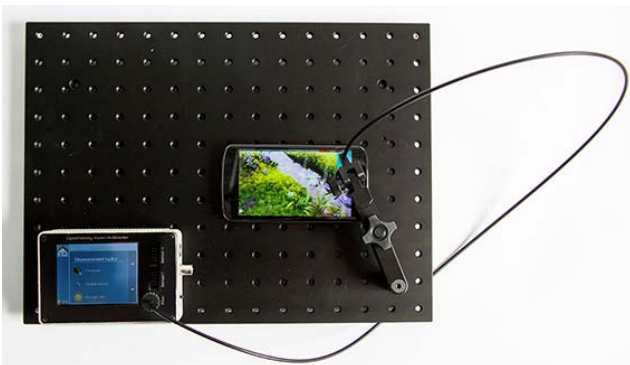
Are you sharing videos with Facebook? - Audio/video synchronization may really suck

Sharing videos over various social media services (Vimeo, Facebook) is increasing fast. People are sharing their personal videos on Facebook and YouTube as well as watching commercial material which is shared on popular services especially by official sports, entertainment and media authors. This challenges not only device manufacturers, but online service providers to improve the video playback features of the services.

Although the performance depends on the used device and internet connection, some features can be associate directly to the quality of the service. In addition of jerkiness and dropped frames one other key feature of the video performance for the watcher is lip sync – a synchronized timing of audio and video. When the popular material nowadays are fast sports with special sound effects like in ball games or dance and music videos, the Lip sync is especially essential for watching experience.

1. Measuring Performance with OptoFidelity Video Multimeter

We measured the video sharing performance of the desktop and mobile service by using the **OptoFidelity Video Multimeter** measurement device. The OptoFidelity Video Multimeter *is a professional measurement solution for measuring the true and objective video playback performance of a mobile, tablet or any multimedia device. The Video Multimeter also has an option to measure lip sync.* The video was measured optically from the display and the audio electronically from the AV connection. The measurement is not bound to any technology, software or hardware, and carries out the analysis from the user point of view.



Picture 1: OptoFidelity Video Multimeter measurement device + test set up

1.1 Test set up

In this test we measured five most popular video services: Facebook, Vimeo, Flickr, YouTube, MySpace (only desktop version available). We tested both the desktop and mobile service performance. OptoFidelity's video Multimeter test video (mp4, 25fps) was uploaded to each service.

Setup1: Video Multimeter measuring the desktop service performance

- Used PC: HP EliteBook 8540p with W7
- Browser: Chrome (ver 39.0.2171.99 m)
- Internet connection: high-speed internet via WiFi

Setup2: Video Multimeter measuring the mobile service performance

- Mobile device: LG G3 Smartphone
- Native service provider applications
- Internet connection: high-speed internet via mobile 4G

1.2 General video playback performance

Three qualities were measured in the test. First of all we measured frame interval deviation, which presents to the user as jerking, the target value for deviation is 0 ms. Second measured value was the average speed over the whole video clip: AVG fps. The desired value varied depending on the reported speed of video (25 fps). The third quality measured was the percentage of dropped frames over whole clip. The higher the dropped frame value, the more jerking the user can see in the video.

1.3 Lip Sync measurement

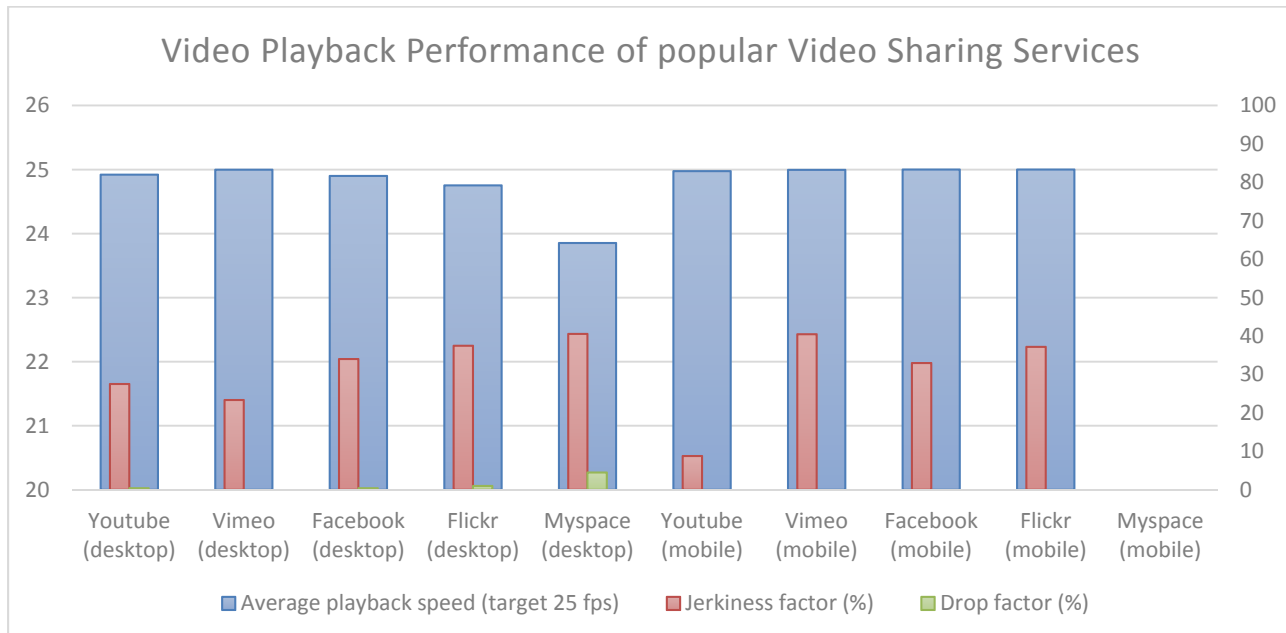
We measured also audio/video synchronization (called also lip sync). In this synchronization if the audio lags behind the video, the actor's lips can be seen moving on the screen, but their voice will be heard afterwards. If the audio is ahead of the video, an actor's voice will be heard before their lips are seen forming the lines and a sound effect will be heard before the event takes place on the screen, for example. There is no natural situation in which the audio would be ahead of the video, which is why this feels particularly disturbing to the viewers.

OptoFidelity has determined limits for the lip sync error that indicate how differences in synchronization affect the viewing experience.

LIP SYNC	LIMITS
Good	up to -15 ms ahead or +45 ms lag time
Moderate, the audio leading or lagging the video may interfere with the viewing experience	up to -45 ms ahead or +125 ms lag time
Poor, the lip sync error is clearly noticeable to the viewer	more than -45 ms ahead or +125 ms lag time

2. Results and conclusion

Overall all the video service performed well what comes to general playback performance like speed and dropped frames. All services performed better in desktop use. Also all the services had some problems with video jerkiness.



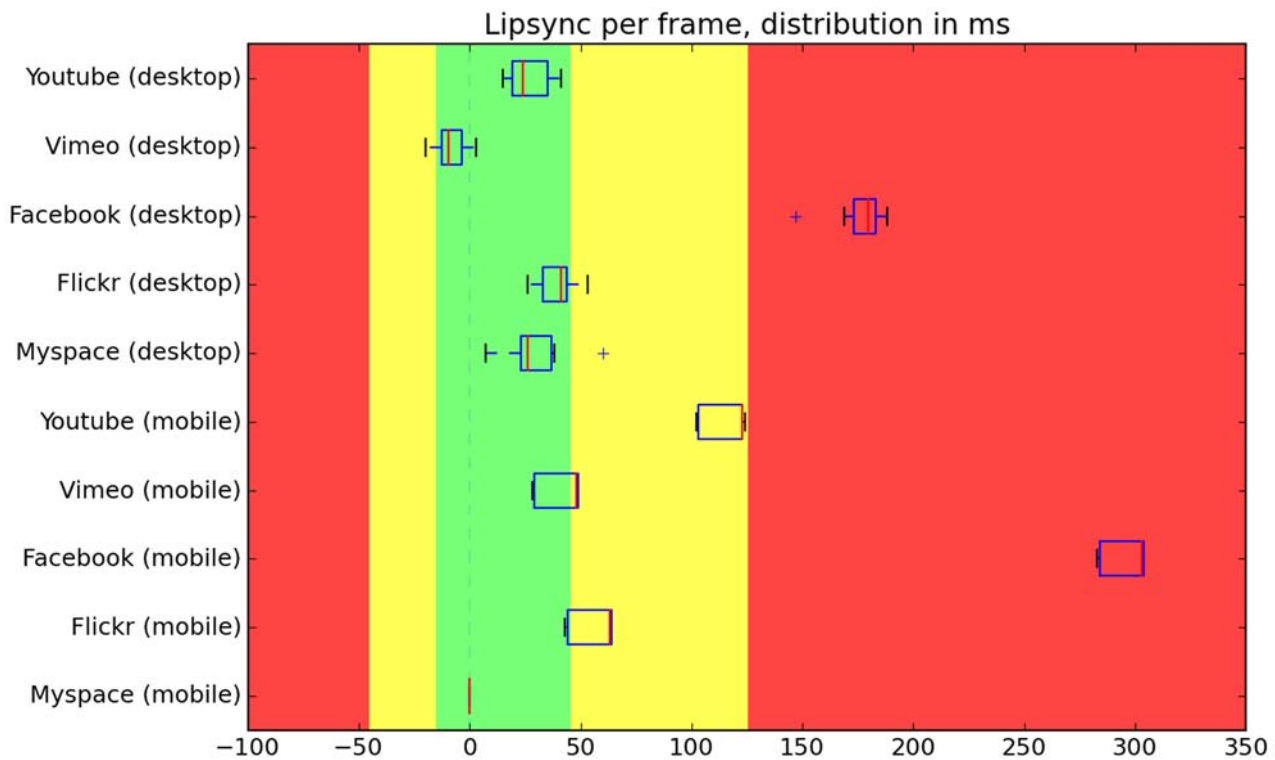
Picture 2: Video playback performance results

Among the browser based desktop services, **Vimeo** has overall the best performance, however its video jerkiness is still quite bad and detectable for watcher and human eye. What comes to lip sync performance Vimeo is only a bit early in desktop use. In mobile use, Vimeo is a little late, but the results are within good level and not noticeable for watcher. On the opposite Vimeo's mobile service/application is - quite surprisingly - the lowest performing of all candidates.

Facebook's desktop service has bad audio/video sync error and the audio is surprisingly late, but it is far better than Facebook's mobile application, which has even worse performance and weakest among all the services. Measurements pointed nearly 300 ms late audio when sharing videos through mobile. That is disturbingly detectable delay for watcher and surprising result for service this commonly used.

The mobile service video playback performance of the **Youtube's** is very good, except for the audio/video sync, which is moderate. In mobile use, this difference can be interfering the viewing experience.

Myspace was only service which had also noticeable problems with playback speed, also the jerkiness was highest among tested services. The lip sync results of the Myspace is good as well as with other desktop service versions.



Picture 3: Lip sync results

As mentioned the performance of video services depends also on the device and internet connection. Even when this has been taken under consideration, there were some surprising lacks in the performance. The speed problems, jerkiness and especially the lip sync are key features when watching videos. When the business of the video service/application providers lies on a good video watching experience, the lack on the performance a.k.a in their key business is not acceptable. Especially the lip sync performance of Facebook can be very unpleasant surprise for more than billion users.

Have you noticed these differences when sharing videos through these common services?

3. More information about Video Multimeter Measurement device

Product page:

<http://www.optofidelity.com/products-and-services/test-automation/video-playback-performance/video-multimeter/>

Video Multimeter on Youtube: <http://youtu.be/IRIHNYbtob4>

Case study: Lip Sync of popular mobile devices:

<http://www.optofidelity.com/case-study-lip-sync-of-popular-mobile-devices/>

Case study: Video playback performance comparison of six popular smartphones

<http://www.optofidelity.com/video-playback-performance-comparison-six-popular-smartphones/>

Would you like to have more information? Contact sales@optofidelity.com