Preparing Presentations in Pandemic Times

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Preparing videos for TUG 2020 (or other) presentations

- Microphones
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You have a choice of giving your lecture live, but it is much preferable for you to record it and upload it ahead of time. In this way we cover all bases in the case of a malfunction, poor bandwidth or some other problem.

We have provided below some hints about how to produce your video (live or recorded). There are dozens of ways to do this, and this is just a brief guide on the most important topics.

Microphones

First, let me state that *sound* is the most important thing in a online lecture. People put up with a bad picture, bad frame, bad lighting and even spotty bandwidth . . . but bad sound drives viewers away immediately. How good it is and how good it can get depends on a lot of stuff, but if I could make a 'generic' discussion of the problem — here it is:

There are 8 types of connectors commonly used by people on computers/laptops/phones. If I could order them from *bad* to *good* it would roughly be:

1. Computer: built-in mic — *worst*
2. Phone: built-in mic
3. Bluetooth
4. TRS
5. TRRS
6. XLR (3 pin)
7. USB-C
8. USB — *best*

Just about the worst option is to use a 'built-in mic'. In general it is awkwardly pointed (ceiling is the most common position) and it picks up sound from the keyboard and vibration from the machine, etc. There are the same issues with a phone's built-in mic that is manufactured with a dual purpose — to pick up sound from close and from afar (when used as a speaker-phone), avoid wind noise, etc. These are made for too many things that you do not need in a lecture. The list of problems: echoes, unintended pick up, goes on and on. There *are* a few computers that have built-in mics that work well, but most of them are junk.

The next worst is to use a Bluetooth headset. Some of them could be extremely expensive, some of them have fancy pick up of sound using the eardrums, but all of them introduce a lag in the sound stream that is extremely uncomfortable to watch. The pick-up and digitization in a small unit powered by batteries, and then transmission to the laptop wireless, inserts all sorts of dampening and alters the sound in unpredictable ways.

The next least bad thing you can do is use a mic or a headset that inputs into the analog port of your machine. Depending on the quality of the headset and mic it could be doable, but most users try to use the *same* headset they use for their phones and end up inserting a TRRS plug into a TRS port on the computer. They fit into the hole, but the connections are completely different — another recipe for disaster.

A good quality and/or professional mic does not need to be expensive. There are some under $100, and they will have either an XLR port or a USB. The XLR will need a cable to convert to TRS, which is cheap and will leave digitization to the sound card on the machine. The USB will take care of the digitization and feed the stream via USB to the machine. The two solutions are among the best and the USB providing one of the cheapest.

Here are a few mics highly regarded by the podcasting community:

- Blue Yeti USB Microphone
- Audio Technica ATR2100x USB Cardioid
- Microphone Condenser Recording Streaming 669B

I currently use this last one, the FiFine. It is one of the best under $50. If you ever experiment with a professional USB mic — you will never go back to built-in ever again.

Network & Bandwidth

Your machine should be connected by a *wired* network; that is, preferably avoid the two other commonly used types of connections: WiFi or 4G networks, no matter how convenient they may be. Even on the best routers a wired connection has a ping that has an order of magnitude faster than wireless on the same router.

The other very important feature of network is the upload speed.

You can measure both at `https://www.speedtest.net/`.

Display the page and click Go. It will analyse your connection, pick up the closest data centre to you and test your speed to *that* server.

If your connection upload speed is below 20 Mbps and our pings are above 5 ms and/or your connection has low latency numbers then you should consider recording your lecture and sending it to us ahead of time.

Frame & Cameras

Almost any camera on a modern laptop should do a good job for a conference call and lecture. Their position is another story — because of the frame.

The frame should be from the superior 1/3 of the torso up completely encased within the frame — with the camera at eye level — as in the examples below:

There are several other possible frames that work well, but they are not easy to control nor to achieve, especially if you are recording by yourself. Examples below are for not centered and other angles of view.

Laptops with bad cameras

There are laptops with *bad* camera positions — an example of this is the Dell XPS line of laptops prior to 2020; its camera is located in the left lower part of the bezel of the monitor. The camera

points straight up at a sideways angle in front of you. It picks up an unflattering view of your nostrils and deforms the view to an unacceptable frame.

The only solution for this problem is an external webcam. Almost all on the market right now will give you a good return. The most important issue it to be able to position it at eye-level, and depending on your set-up that could be done using the bezel of a monitor or require a small tripod or some other support.

Even with a good laptop webcam, you will need to move it up, from the table, a small bit. There are a number of supports for this, but a pile of books will work fine most of the time. The eye-level at the top of the screen is also the correct ergonomic position for a laptop use, so if you *do* use your laptop screen for a lot of work — you probably should consider investing in a stand.
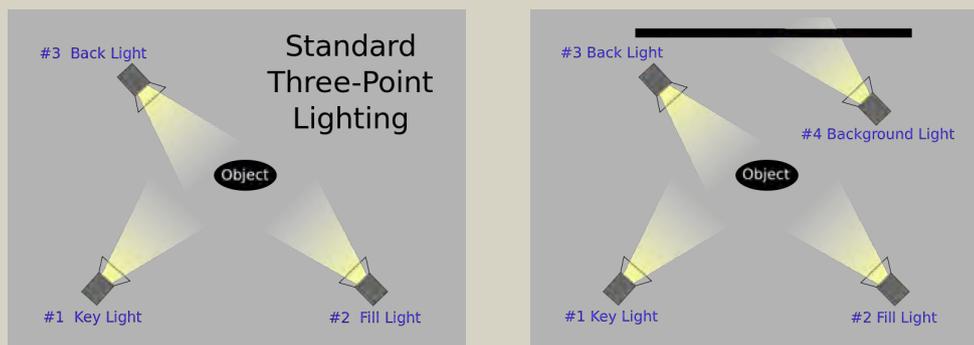

Lighting

Most of the reasons why some videos look poor are *not* related to the camera, but to bad lighting. In general one of the best ways to improve the quality overall is to spend a little on your lighting setup.

A simple and small setup can be made with 3 lamps. A central one with a powerful LED, called the *key light*, and a couple of others whose functions are to soften the shadows and illuminate the background, called the *fill light* and the *background light*, respectively.

The key light shines directly on you, preferably at an angle with the camera, and not directly at your face, and coming from a higher height.

The fill light also shines on you, but preferably from the side and at the same height as your face, usually softer and less bright than the key light.

the backlight shines on the subject from behind, but also at an angle. It serves to separate yourself from the background and provide depth to the scene.

Lighting should be:

- LED preferably;
- come from the general front direction;
- at an angle, both pointing down and sideways;
- reflected — not pointing directly at you;
- never from behind — not even windows.

It is not always possible to get a spot on a pedestal arranged properly, reflected by an umbrella for best lighting, but with a small lamp it is possible to experiment a bit, bouncing the light at the table first to get good illumination.

There is a lot about lighting on YouTube since this is their bread and butter. Do a search for 'Lighting of YouTube studio' and 'Three Point Lighting Setup' and you should hit plenty of tutorials.

Backgrounds

If you are doing a live lecture try having a natural background behind you, instead of artificial backgrounds produced by Zoom — because they take a lot of the machine away to process the slight movement against the background, the processing is never smooth and lots of video artefacts are produced, and also may distract viewers unnecessarily. Even for a recorded session a plain background works best, free of direct light or other distractions.

We realise that depending on the situation this may be necessary. In this case we would recommend you considering pre-recording your lecture.

If you *really* want to display yourself against the bridge of the USS Enterprise or even the peaceful image of the Earth on the background, as viewed from the ISS — leave it for the break-out social sessions. We will have plenty of that in-between lectures.

Additional Hardware

Document cams

If you need to display some form of content that is created live, like for example a drawing or mathematics, you may need a doc-cam or a support for your cell phone or tablet, so you can display it.

IPEVO makes a very nice 4K doc-cam for $99 and a support to turn your phone/tablet into a scanner can be had for very little change or even be made at home from plywood or cardboard.

Zoom allows you to connect a USB doc-cam directly from the app. The phone could be added as an additional user and then share that view.

You can also do drawing on a tablet with a (good) pen and share that image directly on Zoom. The whiteboard provided by the Zoom app is *not* a good option for any of this.

Another way to simulate a document visualiser is with an iPad, mounted similarly to the suggested use of an iPhone. This can be operated in various ways:

1. as a separate participant in the Zoom session, given co-host privileges;
2. using screen-mirroring as a screen-share option in Zoom;
3. using screen-mirroring into a window on the laptop/desktop computer.

With the third option you can then share that individual window by itself, or have it in view when sharing the whole Desktop as a screen. This allows it to overlap or be seen in conjunction with other windows.

Recent Macs do the screen-mirroring as part of MacOS software; whereas older ones may need an extra piece of software, such as 5KPlayer or Mirroring360. Furthermore, the iPad can be connected to a Mac laptop either using a cable (USB or HDMI with adapter) or by using your local WiFi. The HDMI cable and 5KPlayer are preferable, since the WiFi could be already busy with broadcasting the Zoom session.

Headsets

A headset is a good option if it is good. Go for a USB one preferably.

Phone earbuds

Stay away from these *unless* you are using the phone to do the recording. More on that in the section below.

Using your phone/tablet instead of a laptop

Recording with a phone is possible. Phones do have good and adaptable cams, but you will need two essential items:

1. A way to hold it up at eye-level, without pinning it against a wall or some other solid surface. Holding it flat against a surface will create all sorts of artefacts on the sound and image recorded.
2. You will also need to wire yourself to a good mic — and *not* using the speaker-phone function on the phone.

The first one would require a tripod, which is a cheap item and can even come with a camera adapter and wireless controller for the phone.
Here is a link to one: https://www.amazon.com/dp/B07F71DBJL/.

Observe that the best cam on the phone/tablet is the one on the back of the phone so that automatically implies the microphone will *not* be turned towards you. So you will *not* be able to have a feedback on the frame of the video, making the recording a bit more challenging and live video nearly impossible.

Recording yourself

Recording yourself is the best choice of all. It is not very difficult and you open an array of possibilities, where you could re-record some pieces, change between views, slides, camera . . . , add some annotation and even edit the movie.

Guidelines

- The quality of your video should ideally be 'Full HD' 1080p resolution (not higher!); 720p is acceptable.
- The frame rate should be set at 10–30 frames per second, with aspect ratio of 16:9.
- The format should be MPEG-4, if possible.

- For a 20–25 minute video, keep it under 500 MB. Most lectures will not need to be larger than 125 MB for a 20–25 minute video. Hour long invited talks may be up to 1.5 GB.
- Try making a test recording of 5 minutes and extrapolate the size produced by your setup.
- The audio should be free of static or background noise. Use a good microphone if possible. Do not use copyrighted music in the background.
- Due to regulations about online content, please do not allow children to appear in the video.

Talking in front of a camera for half-hour straight is likely not the best way to give your talk, so you'll probably want to introduce the talk with the camera view on yourself and then switch to a slide-presentation or to a combination of a slide presentation with your camera-view on a small corner of the window.
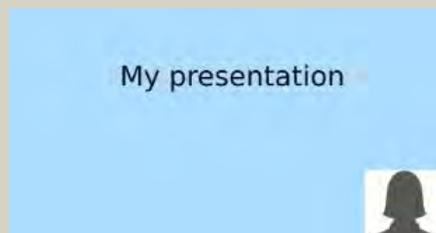
Some of the tools described below have support for incorporating a video of your face.

Screen Capture vs. Presentation Software

Open Broadcaster Software OBS is free software available for Windows, MacOS and Linux. It allows you to capture video from your screen and save it as an MPEG file. It is quite powerful. A good point to start is this nice video tutorial:
https://www.youtube.com/watch?v=9AKhr8wrXvY.

Here are a few additional hints:
- You need to add video inputs. You can add both 'Display capture' to capture your desktop, but optionally also 'Video capture' to capture from the camera (so you can also show your face on the presentation).
- It's best to use File > Settings to define 'Hotkeys' for starting and stopping of recording. I use Alt-R to start recording and Alt-S to stop recording. You can also define hotkeys for 'Pause' that will be useful if you wish to pause during your recording. Once you do this, you can minimize the OBS application and bring up your presentation in full screen mode (the video of your face will not show up on the screen if you have added it to the capture). Then use Alt-R to start recording your video.
  When you are finished, hit Alt-S to stop. This will capture a video to your computer.

QuickTime Player Available for MacOS only.
How to record and export in QuickTime Player:
- In the top menu bar, select File > New Screen Recording.
- At the bottom of the screen are options for recording either the entire screen or a selected portion of the screen. The highlighted one is selected. You may also wish to verify under options that the microphone is turned on, so you can narrate.
  Press the Record button to the right.
- Once it is recording, a recording icon should appear in your status bar.
  To stop the recording, click that.
- When finished, select File > Export As….

Zoom Main website: https://zoom.us. Zoom allows for webcam video to be displayed over your presentation, and can be installed on Windows, MacOS and Linux.
Zoom recording (and broadcasting) allows for: • screen sharing • displaying slides which are readily available from the app controls.

Presentation Applications

Keynote   (MacOS)

How to record and export in Keynote (see also this video tutorial):
- In the top menu bar, select Play > Record Slideshow…
  The slideshow will begin immediately.
- At the bottom left of the screen, you will need to also click Record Audio (a red circle icon).
  This will trigger a countdown and then your audio is recorded.
- Click the red circle icon again to stop recording audio.
- Once you have finished recording: File > Export To… > Movie… .

PowerPoint   (Windows and MacOS)

Warning: some users have produced a video this way that YouTube is unable to recognise.
Do not upload a '.pptx' or '.ppsx' format file — it should be saved as MPEG-4 with the '.mp4' file extension.

The desktop version of PowerPoint has a way to capture your presentation along with video of your face. There are instructions online for your version of PowerPoint (including Office 365). See also this video tutorial.

Video editing

When you record a 20–25 minute video, you may find that you stumble at some point and want to edit out a section. One solution is to record yourself one slide at a time, and pause the video recording while you think of what to say. If you do want to edit after the fact, there are quite a few options for simple video editing, including the following:
- VLC (https://www.videolan.org/) — Linux, Windows, MacOS
- OpenShot (https://www.openshot.org/) — Linux, Windows, MacOS
- Shotcut (https://shotcut.org/) — Linux, Windows, MacOS
- Avidemux (http://avidemux.sourceforge.net/) — Linux, Windows, MacOS
- Lightworks (https://www.lwks.com/) — Linux, Windows, MacOS
- kdenlive (https://kdenlive.org/en/) — Linux, Windows
- iMovie (https://www.apple.com/imovie/) — MacOS only

Observations for MacOS users:
- Avidemux is for MacOS (Mojave) only.
- Lightworks requires registration.

Video editing always takes a lot longer than you think ought to be necessary. This is because the original and final files involve heavy compression, so the application has to uncompress, then edit in (or out) your changes — for which you have to research the start and stop point you need to cut — followed by re-compression to get the final result.

It can take many, many minutes for this all to occur. Maybe even an hour! One must never expect it to be done quickly — that just does not happen.
You may also need a "better than average" machine for it to go smoothly.

Minimal Requirements

The "minimal requirements" are indeed quite flexible, especially if you do not require video-editing and similar CPU-intensive processing. So if you have an 'average' machine acquired in the last two-years you are probably okay to do this online and certainly to record and send it to use, so we can play your lecture automatically.

So listing the most important steps I would have:
1. Position your camera well — at eye level, possibly elevating your laptop.
2. Find a distance that produces a good frame.
3. Test your microphone to see if it sounds natural.
4. Get a good network connection if you are going to present live.
5. Illuminate your face as well as the background behind you.
6. Choose a way to record it.
7. Switch between face and slide-presentation or other material, as needed.

At the time of recording

If you are going to show yourself a lot on the video, the best posture will be standing-up, and looking straight into the camera. Of course, if you are briefly switching to a slide or some other demo this may not be important and the best position will be seating and with access to the machine. The best of both worlds is to have the machine high up on a stand where you can do both from the same position.

So on the day of the recording:
1. Pick a quiet spot to run your talk — preferably away from interruptions by children, pets, etc. We may need to get special permission from you if a child appears on the video.
2. Do a dry run — it is good habit. You most likely will find out that your timing is different in front of a camera than in front of a live audience.
3. Dress in neutral colors. Not stripes. Wear colors that are different from your background.
4. Have some water ready by your side — most people tend to talk faster if they are *not* in front of a live audience and because of the different pace you may need more water.
5. Lastly, take a bathroom break before you're on.
6. Stand while you deliver your talk — everything works differently if you are sitting down, your voice, posture, timing and body language.
7. Get the frame correctly, so you do not need to check your image all the time.
8. Look at the camera — not the image that is being displayed on the computer. You need to look at the audience, not to the side.
9. Greet the attendees — you are in front of a live audience, even when you pre-record your lecture.

Logistics of the meeting

1. The introduction of the speakers will be done live.
2. You may choose to give a pre-recorded talk or live.
3. We ask you to come in live and monitor the chat during the talk if you are pre-recording.
4. If you are live, one of us will check the chat for you and pass you the questions at the end.
5. If you pre-record, please deliver it to use via one of the large-file service transfer, Google Drive, Dropbox, . . .

Support

If you need support of any kind, get in touch with us at: tug-conferences@tug.org.

We will help you produce a nice presentation no matter the source of your problem.

We can also conduct a two-way conversation on Zoom and recommend adjustments of your set-up if you want to improve it in any way. Just send us a request with a description of your hardware and one of us will connect.

Many thanks for being a contributor to TUG 2020.