

**NSF IGERT 2013  
VIDEO & POSTER COMPETITION**

# **Moviemaking Guide**

## The Importance of Video

You'll be making a short (< 3 min) video. The video should complement the poster and make the research more accessible to a general non-scientific/non-technical audience. Consider using video footage from the field or produce a slideshow with audio narration. Be creative!

To craft an effective video, you do not need to be a master filmmaker. In filmmaking content is always more important than technique or production value. Many prominent documentaries, distributed all over the world, have not become famous for their mastery of the filmmaking craft – they are watched and recommended because of their powerful content. They are successful because somebody found the courage to take up a camera and record subject matter that was important to them.

Our goal is for you to gain enough knowledge for you to communicate effectively through video – not to become a master filmmaker. The most important part of making a video is to decide what should be included in the video and in what order it should appear. This does not require any knowledge of cameras, microphones, or editing software – it can be done on a piece of paper. So if this is your first time making a movie, we encourage you to embrace this opportunity as a means to learn a skill that will serve you throughout your career. And if cameras or editing software are not your thing, get out some paper, plan your movie, and *then* think about what technical advice you need to accomplish your vision.

*If you have questions while preparing your video, Jim Galdos, our videographer, is ready to help. Please join the discussion and post your questions or comments to the 2013 Competition Group on IGERT.org: <http://www.igert.org/groups/82>*

## Looking Ahead: Planning Your Video Production

As you get ready to make your movie, there are two high-level rules to always keep in mind:

### **RULE 1**

#### **Plan, plan, and then plan more.**

In filmmaking, detailed planning is always rewarded. Even if your final movie turns out differently than you expected, the time you spent planning will have drastically improved the result.

Every movie begins in the pre-production, or planning, phase. You'll want to think about how to best present your research and what materials you can gather or create to express your ideas. While planning, try to visualize the final movie. What do you see and hear first? What is the last image the audience will experience? Create storyboards, draw sample frames and stick figures. Once you start getting some ideas, look for other movies and presentations that inspire you further.

## RULE 2

### Leave plenty of time.

Even if you are not shooting new footage, making a movie always takes longer than expected. Leave as many days/weeks as possible for editing – even if you have experience with editing software. Editing rewards attention to detail, and a rushed edit will come across as exactly that.

## The Three Phases

Creating a movie consists of three phases: pre-production, production, and post-production.

**Pre-production** is the planning phase. This is when you think about what should be included in your movie, how your movie should feel, and in what order your content should be presented. Consider what visual and audio content would be most impactful for your audience. Think about the style of your movie and how you can engage the audience's emotions. Once you have an abundance of ideas as to what should be included in your movie and in what order, it's time to write a script. The script is your blueprint for assembling the final movie and should list the visuals, audio, and titles or other text that you plan to use, and the order in which you plan to use them. In preproduction, you also carefully plan for any production – the creation of new content – that you will need.

During **production**, you create any new content you require. This is when you shoot footage, record voice over, and take photos. The production phase often requires more people to be on-hand to assist with various filmmaking tasks.

In **post-production**, you bring all of your gathered and created footage into an editing platform, such as Apple iMovie or Windows Moviemaker. Next, you order the footage according to your script. Once your movie's basic order is established, you can begin to add titles, transitions, sound effects, or music. It's very common in post-production to discover that something in your script does not work the way you intended. That's ok! The primary task of post-production is gradually reworking the succession of content to have the maximum impact.

We will now look at each phase in more detail.

## Pre-production

Pre-production is the time for thinking, writing, and discussing your ideas with others. Pre-production is the phase of ideas and planning, and your main goal is to generate a script. A convenient way of organizing a script is to divide a document into three columns: one for visuals, another for audio, and a final column for everything else - titles, labels, special effects, etc.

VISUALS	AUDIO	TEXT
....	....	....
Interview with Professor	Voice Over: "So we asked the professor..."	Title: Professor Jones Director of the Dept.
Photo of outer space	Continue into Professor speaking. Professor continues describing the star.	Title: Outer Space Sound Effect: space engines
....	....	....

The script is your blueprint and will help you visualize your movie before you make it. A well thought-out script will also save you hours or days of effort because it is much easier to refine your ideas on paper than during production and post-production.

## Structuring Your Script

When making a movie, you are telling a story. Any advice that you would give somebody on how to tell a good story applies to making movies. Here are some storytelling tips to help you structure your movie:

### 1. Big Ideas

At the top of your script, write down the big ideas you want your audience to experience during your movie. The big ideas can be a set of emotions, a fascination with something, outrage over an injustice, the power of human resilience, hope for the future – whatever you want your audience to think and feel the most powerfully. Use these ideas to guide the structuring of your movie.

## **2. Use Each Part of the Story Well**

Stories can be divided roughly into thirds: the beginning, middle, and end. As with any good story, you'll want to hook your audience in the beginning and deliver a fascinating payoff at the end. Depending on your content and storytelling style, the length of these three parts may vary, but it is valuable to consider each part as a separate segment.

### **The Beginning**

The beginning is when you capture your audience. Good stories often begin by raising interesting questions, showing us things that don't quite make sense yet, or posing an intriguing dilemma. It is far more effective to provide your viewer with intriguing questions that they really want to have answered, than to give away the "punch-line" too soon.

### **The Middle**

The middle of your story is where you develop these initial questions and introduce new obstacles. You may answer one of the questions from the beginning but then show how this raises a new challenge that must be dealt with. The middle of the story is often the most challenging to write because it's easy to lose your audience with dry content or lack of structure. Give extra thought as to how you will "carry your audience through" the middle of the story.

### **The End**

Your ending is the time to surprise us with your findings, expand our thinking, illustrate the impact of your research, or engage our emotions. While grabbing the audience's attention at the beginning is very important, the end of your movie is the most important segment. The ending has the greatest impact on an audience's perception of your movie. It is important to remember the ending is not just the final shot, but the entire last third of your movie. Ideally, you would allocate just enough engaging content to the beginning of the movie, but then save your best stuff for the last third of the movie.

## **3. Think in Scenes**

Even though your movie is not narrative fiction, try to break it down into discernible scenes. Focus on connecting one scene to the next. Try to create causal relationship between scenes - the second scene in your story should necessitate the third scene, and so on.

## **4. Get in Late, Leave Early**

A classic filmmaking rule is to "get in late and leave early." In a short 2-3 minute movie, this is particularly relevant – you don't have any time for excess material. See how late you can start your video clips and how soon you can cut to a new clip while still preserving intelligibility.

## **5. Step Outside of Your Own Experience**

Always imagine someone viewing your story for the first time – you spend a lot of hours immersed in your subject matter, which makes it easy to presume others' understanding. Make sure we have enough contextual information to appreciate your narrative. A corollary to this point is that the areas where you have spent the most time are not necessarily the most interesting to your audience – look for the most powerful content, not the most difficult to create.

## **6. Pacing**

Pay particular attention to the pace, or rhythm, of your movie. The easiest way to understand good pacing vs. poor pacing is to watch other movies. Notice how the movies that engage you to the very end, change content at a certain pace. Pacing also needs to be influenced by content. For example, if you have a fascinating shot from the field that takes some time to evolve but gradually builds to an astonishing result, certainly to do not cut away just for the sake of cutting.

## **7. Be Direct**

Usually the best way to explain your ideas is the most direct one – don't overly complicate or formalize your language just because you are making a presentation.

## **8. Always Remember Emotion**

Video is an emotional medium. People are accustomed to having their emotions engaged while watching video and the medium is very effective at doing so. Even if you feel your subject matter is dry and doesn't easily entertain people's emotions, work at finding a connection. As a visual communicator, your task is to discover or create emotional inroads to your subject matter. This can be done through humor, a sense of possibility, human tragedy, injustice, or anything that will encourage emotional engagement with the work.

# **Production**

The production phase can seem daunting to beginners. However, if you closely follow the recommendations below, you will be able to create good footage and audio for your movie.

## **Audio Tips**

These tips for better audio apply to anything from an on-camera microphone, to a handheld voice-recorder, to a recording made on your computer.

### **1. Audio Is More Important Than Video**

While our eyes can bear to watch even the shakiest, lowest quality video, our ears are much less tolerant of bad audio. Taking extra care with your audio will help the audience

enjoy your content, and prevent them from getting distracted by your production value. Conversely, even the most stunning visuals will be ruined by a poor audio track. Try to enforce the following tips as strictly as possible.

## **2. Distance to Source**

Distance is the most important factor in recording good audio. Closer is almost always better. On all your favorite movies and TV shows, there is usually a dialogue-capturing microphone directly above the actor's head, inches out of frame. It is worth making the effort to place the microphone every bit closer. The exception to this rule is that if the microphone is so close you can hear popping every time you utter a "p" sound, you are too close or should experiment with the angle of the microphone.

## **3. Eliminate Background Noise**

If you can hear a background noise with your ears, the microphone can likely hear it even better. Sometimes people assume that because a background noise is low-volume, the microphone will not pick it up. It's not always easy to discern how much noise is getting on the track, so try to eliminate as much background noise as possible before recording. Even the humming of computers, traffic outside, heat and air conditioning vents, and refrigerators are enough to make an audio track distracting.

## **4. Use Headphones**

Always monitor your sound with headphones. Watching audio levels is also important, but the levels cannot tell you if unwanted low-volume noises have crept on to the track.

## **5. Hands Off the Microphone**

Find a way to stabilize the microphone – don't hold it. Microphones and even computers will pick up noise from handling. If you have access to some video equipment, look into lavalier microphones, sometimes referred to as "lapel microphones." These can be clipped to the subject's chest and thus allow close miking. If you have never used a lavalier microphone before, it's a good idea to get training from someone who has.

## **Tips for Better Voice Overs**

### **1. Keep Your Head Still**

When reading from a page, try not to change the angle or distance of your head to the microphone. This will cause dramatic changes in volume.

### **2. Eliminate Extraneous Noise**

Watch out for paper noise when turning pages. Also be careful not to shift positions or fidget while speaking.

### **3. Speak Confidently and Energetically**

Speak confidently and energetically, as if you were telling a story to a friend. Voice over benefits from some exaggeration because we cannot see the speaker.

#### **4. Watch Out for Mouth Noises**

When recording voice over, watch out for breath noises, plosives, and wet mouth noises. Try varying the angle of the mic to reduce these noises and drink some water after each take.

#### **5. Eliminate Computer Noise**

If you are recording on a computer, you don't want the computer's fan and hard drive noises to get on your track. It's a good idea to close all non-essential programs, turn on energy-saver modes, turn down the brightness, keep the computer off your lap, and generally find any way to keep the fan off.

### **Shooting Video**

Shooting new video can provide a powerful addition to your movie. You can use new footage to put a human face in front of the research. You can set up shots that document the most fascinating parts of your research. Most award-winners from last year's competition included original footage. Here are some tips that will help you improve the quality of your footage:

#### **1. Plan**

Plan as much as possible. Try to visualize the finished movie in your head. Draw storyboards of all the shots you'd like to take. Consider carefully what shots you need to tell your story. You may need wide, establishing shots to set the stage and extreme closeups to highlight details.

#### **2. Pick A Subject**

When framing your shots, try to choose a clear subject or object of interest. Ask yourself if the most important object in the shot, is also the most prominent. Shoot close-ups of important objects. Try filling the entire frame with the subject of your shot.

#### **3. Framing**

Try framing the subject of your shot off-center. When conducting interviews, don't be afraid to give the interviewee "a haircut." This means that you want to frame the person from the mid-chest to just below the top of the head, effectively trimming a little bit of the person's hair from the shot (but not too much). If you feel this looks awkward, leave a small amount of headroom at the top of the frame. For more information, try searching online for "shot composition" and "rule of thirds."

#### **4. Avoid Overpowering Light Sources**

Don't shoot into bright lights, the sun, or windows unless you have a specific reason to do so.

## **5. Stabilize the Camera**

Use a tripod or some other means of stabilizing the camera. If you wish to pan or follow your subject, practice the motion with the tripod until you can move the camera smoothly.

## **6. White Balance**

Learn how to set the white balance on your camera. This can usually be done by filling the frame with a white piece of paper and hitting the white balance button. Using the camera's auto white balance will sometimes work, but the camera can easily be tricked into an incorrect white balance, which will tint your footage.

## **7. Shoot B-Roll**

B-roll is supplemental footage used to illustrate what a voice over or interviewee is talking about. For example, say you have footage of someone discussing the high-tech lab where you collect data. B-roll would consist of footage or still images of that place, which would then be cut into the interview footage. Watch the nightly news, investigative reporting shows, or sports featurettes to see the importance of b-roll.

## **8. Shoot Widescreen**

Shoot HD video or standard definition in widescreen (16:9 aspect ratio) because your final movie will be presented in a widescreen 16:9 aspect ratio. Shooting in a more square aspect ratio will result in black bars on the left and right of your footage.

## **9. Look for Movement and Action**

If you've gone through the trouble of getting your hands on a video camera, don't always use it as a still camera! Think of how you can use moving objects in your shots to enhance your content. Just beware of shaky hand-held video.

## **10. Use Headphones**

Always use headphones (preferably ones that enclose your entire ear) to monitor audio. Use what you hear in the headphones in conjunction with what you see on your camera's audio levels to ensure good audio. The audio levels should be consistently between halfway and the end of the meter, without ever reaching the end of the meter.

## **A Note on Copyrighted Material**

Ideally, you should either own the copyright to all material in your videos, or get permission for the use of third-party material, or use material that is subject to a license like a Creative Commons that allows free use. If you do not own all of your material or have permission or a license for third-party material, your use of such third-party material should still qualify as fair use. Under the fair use doctrine, no permission is necessary for non-commercial, educational usage. In all events, you should cite your sources.

# Post-Production

Finally you've made it through the planning of pre-production and the logistics of production! The beauty of post-production is that you have much more time to consider your decisions. However, the difficulty of post-production is that it will therefore consume far more time than you anticipate! Start early and think about your cuts before you make them.

## Editing

Here are some tips for editing your movie:

### 1. Pacing

Editing is about rhythm and pacing. Always ask yourself whether you are staying in one place for too long or rushing through content too quickly.

### 2. Stay Organized

Gather all of the materials you plan to edit and organize them in logical folders. Rename files so you can easily identify each one.

### 3. Be Ready to Search

There are so many possible questions regarding editing, we highly recommend getting accustomed to performing a quick online search for your questions. It is very likely others have had the same question and this is common practice even among professionals.

### 4. Intuitive Cutting

A famous editor, Walter Murch (*Apocalypse Now*, *The English Patient*), prescribes one helpful method of determining when to cut. He advises to play the footage and hit stop (usually spacebar) when you intuitively feel that a cut should occur. Observe the current time and repeat this process a few times. If you intuitively stop the footage at around the same place each time, this is where you cut.

### 5. Save Often

Video editing programs tend to crash when you have *just* completed your best work. So make a habit of hitting Cmd+S, Ctrl+S, or whatever your save-shortcut may be.

### 6. Experiment with J-Cut and L-Cuts

A J-Cut is when the sound of the next shot begins during the current shot. A common example of a J-Cut is when you hear an interviewee talking before you see their face. This builds interest as the viewer intuitively wonders, "Who is talking?" An L-Cut is the inverse arrangement. In an L-Cut, the sound from one shot continues to play as you cut away to another shot. This is commonly seen when, during an interview, there is a cut to b-roll images while the interviewee's voice continues to play "under" the new b-roll shots.

## 7. Transitions

Feel free to experiment with transitions in your editing software of choice. However, remember there is nothing wrong with straight hard cuts.

## Exporting

The video should be exported using some form of H.264 compression. While there is no official file-size limitation, we strongly suggest that you keep your final movies under 250MB. This will make it much easier for you to upload through our website.

Since the file will ultimately reside on Vimeo, their guidelines are our guidelines. Here is a link to Vimeo's recommended compression settings:

### **Vimeo's Recommended Compression Settings:**

<http://vimeo.com/help/compression>

It's also important to note that a file's extension does not signify how that file was compressed. Extensions of .mov, .mp4, .m4v, and .avi can all contain files that were compressed using H.264.

When compressing your video, if you see a place to specify an average bit rate, use 5,000 kbps. This is Vimeo's recommended bit rate for HD video and will keep your video file relatively small.

Vimeo has more detailed tutorials on exporting for the most popular editing software.

### **Windows Live Movie Maker Export Lesson:**

<http://vimeo.com/videoschool/lesson/30/video-101-exporting-to-share-on-vimeo-with-windows-live-movie-maker>

### **iMovie Exporting Lesson:**

<http://vimeo.com/videoschool/lesson/39/video-101-exporting-and-sharing-to-vimeo-with-imovie>

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