THI Lehrvideo Community Handbook
Version 1.0

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November 3, 2025

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1 Introduction

This guidebook is offered as part of the THI Lehrvideocommunity Project. It is designed to assist both students and professors in producing high-quality videos for various purposes - from work and project presentation to peer education. It offers a useful starting point if you are facing such task for the first time, as well as potential avenues for improvement for those already more experienced.

2 How to plan a video

There are several things that go into creating a good video, and there are several key steps you need to follow before you start filming or editing anything. No matter what video you are making, it is communicating some information, so you need to sort and structure that information first.

2.1 External guidelines and limitations

Make sure you are aware of all the limitations and specifics that you have to follow. These are different from best practices and are much less flexible. Is there a time limit you need to work under? Specific segments you need to include? Type of materials you are allowed to use? Formats your need to export to? The more specifics you can gather before setting out the better. What about the style? Should the video be formal or is the style up to you?
If you are making an educational video, these limitations are usually imposed by the platform you need to upload your video to, or general educational guidelines for your institution. Or, if you are a student, some additional ones might be added by your professor (if you are a student - don't forget to ask! If you are a professor - don't forget to prepare them in advance!).
If you are creating a promotional video, especially for a specific event, these guidelines are usually provided by the event organizers. If you are uncertain, it is always best to ask than miss something.

2.2 Goal

The next step is figuring out what the goal of the video is. Even a simple task of presenting your work or explaining some topic might have different objectives. Do you want to simply demonstrate your achievements? Attract new members or maybe investors? Educate others or simply share an interesting topic? Clearly defining your goal helps you understand what information you need to convey, as well as choose the style of the video. For example, promotional videos need to attract more attention, while educational ones might benefit from being less flashy and more deliberately paced. It is always helpful to define what should change after someone watches your video - perhaps they are now excited about your startup, or understand some theoretical concept and can use it to solve specific tasks.

Educational videos in particular require specific learning objectives - what should the viewer be capable of after finishing the video? What questions should they be able to answer and what tasks should they be able to complete? It is important to set these goals in advance, because the they will guide the content and pacing of your video.

2.3 Target Audience & prerequisite knowledge

Next it is important to determine what your target audience is. Are you making your video for students or for professors? Competition judges or general public? This should inform both the format of your video, as mentioned previously, and its content. Any new information is always based on some previous knowledge. If you are explaining some mathematical model, it uses multiple mathematical concepts that the viewer needs to already know, in order to understand your explanation. If you are presenting some new tool or product, they are usually meant to solve some problem, and if the viewer doesn't even know this problem exists, they are not going to be very impressed. For that reason, it is useful to clearly understand what knowledge is required to understand your video and separate it into three categories:

1. **Common or expected knowledge** This is the knowledge you can expect from your audience - from basic ideas, such as "water is wet", "numbers can be bigger or smaller", to more specialized knowledge in certain contexts. For example, when making an educational video for a graduate level computer science course, you don't need to explain what an integral is. This type of knowledge you can take for granted and don't need to reiterate unless necessary. However, it is sometimes useful to quickly refresh the basics to make sure everyone is one the same page, or specify what knowledge you expect from your audience.

2. **Specialized knowledge** This is the trickiest type. In your video you are likely going to talk about some specialized subject. If you have been working on something or studying something for a while, some knowledge might seem so obvious, that it is not worth repeating. But people viewing your video don't always have your experience. Even your colleagues and peers don't have an identical experience and knowledge, and even if they do, it is still better to remind them about the key relevant concepts. If you are making an educational video - remind the viewers about the key concepts you are going to build on. If you are making a promotional one - don't forget to ensure that the viewer has the necessary knowledge to understand why your innovation is so important. Don't be afraid to consult others to establish what the threshold of specialized knowledge is in your particular context.

3. **New knowledge** This is the point of your video - the new information you are going to present. The better you structure the previous two parts, the easier it is going to be for the viewer to understand and evaluate this

most important part. New information should be clearly denoted, well structured and contribute to the goals you have outlined earlier.

2.4 Order of information

Every video, just as every good presentation, follows a specific chain of thought. Information always needs to be presented in a certain order - for example, you can not offer a solution if the audience doesn't understand what the problem is. Start with simple and established knowledge, increase novelty and complexity as the video progresses. This ensures that even if the viewers have different backgrounds, they everyone is caught up by the time you introduce the key point.
At this point it is very helpful to create a script or a storyboard for your video, listing what you need to prepare for each segment. It is also a good idea to get outside perspective, because if your video doesn't work at this stage, it is much easier to fix it before you start filming or editing. Try using your script to present your information to someone and listen to feedback.

2.5 Quality of information

This is something you always have to keep in mind, no matter what kind of video you are making. It is always a bad idea to promote something using false data - the video is going to have the opposite effect when someone notices the mistake. But this is especially relevant if you are making an educational video. People are going to rely on this information, and if some of it is false, it is going to have a cascading effect on everything they learn afterwards. Today there are countless sources of bad information, fake data and theories that sound great but have no basis in reality. Approach gathering information with the attention and seriousness that this process deserves - check and cite your sources, verify the data, and, perhaps most importantly, remember that you have people around you who are very experienced in the area. Don't be afraid to ask your professor or a colleague to check your script before you start filming, it might save you from making a serious mistake and letting down those who wanted to learn from your video.
And remember, even if Large Language Models today are capable of writing well structured and convincing texts, using them as sources of information is not a good idea. Verify your data and check your sources.

This should provide a solid foundation for your video - you know what information you need to present, in what order, know your target audience and the specific limitations that you need to follow. You've answered "what?", not you need to answer the "how?"

3 Making the video

3.1 Choice of format

You have your information and the order it needs to be presented. Now you need to choose the best format to convey it in. Is it better to stand in front of a green screen and speak this information out loud? Is it better to put some text on screen? Maybe display an image or an animation? Knowing which format works best with which information is a skill you develop with practice, but there are a few general principles you need to keep in mind.

1. Similar information needs to be presented in a similar way. If you choose to put a title on screen for a particular segment, it is a good idea to keep that pattern, so that the viewer can easily understand where one segment ends and another begins. Same goes for other elements - if you outline some key aspects of one topic using text, it is a good idea to do the same for other similarly sized topics as well. If you show an image to illustrate a particular concept - other concepts of same importance should be illustrated as well.

2. Complex information usually requires time to examine it. If you are describing a complex process, it is a good idea to present the user with either a static diagram or a step-by-step animation, so that they could quickly refresh the context of your explanation at a glance and see previous steps.

3. But reading and listening at the same time is difficult. You can convey a lot more information with audio, while visual information is very suitable for conveying specific small cornerstones. If you are displaying text on screen, try to make it short and precise, so that the viewer can grasp it without actually taking the time to read it through. Additional upside of text on screen is that the viewer can return to it as long as it is displayed, without rewinding the video, so it serves as a good scaffolding for the viewer's experience.

4. Visual elements attract more attention, so if your goal is to attract the attention of the viewer, you might want to rely on them more. These include video footage, transitions, animations, and so on. However, spare use enhances the effectiveness - if every second of the video is flashy and every transition is very dynamic, the viewer is likely to get tired very quickly.

Here are the pros and cons of the common formats:

1. **Talking-head (lecture) video**: Video of an instructor speaking to the camera (often with slides beside or behind).
   Pros: Personal and engaging; builds trust and presence.
   Cons: Requires good lighting, sound and camera setup, and editing multiple takes can be time-consuming. Use this for introductions or summaries when personal connection matters.

2. **Screencast (slide or demonstration)**: Computer screen recording (slides, code, software demos, calculations) with voiceover. Great for technical demos (coding, math derivations, software tutorials) because you can highlight exactly what you discuss.
   Pros: Easy to record and edit (you can redo a slide easily), focuses on content not the presenter's appearance.
   Cons: Less personal, can feel dry if overused.

3. **Animated explainer / Whiteboard video**: Graphics or drawn animations (e.g. whiteboard-style) with narration.
   Pros: Highly engaging; excellent for illustrating abstract or complex ideas visually. Animation increases retention.
   Cons: Time-consuming to produce; requires drawing or animation software and skill.

However, nothing prevents you from combining these methods - you could use video of yourself speaking for an introduction, slides with voiceover for the main content, and animations for specific complex points.

3.2 Rhythm and and attention

Well made video always has a particular rhythm. Information should be segmented in such a way, that each segment has its own logical flow - problem to solution, question to answer, and so on. It is a good idea to make segments roughly similar in length, so that the viewer can form expectations regarding the information they are about to receive. The issue of rhythm also concerns use of such things as transitions, camera movement in dynamic shots (in case you want to include camera footage into your video), and so on. Unfortunately it is difficult to define the specific criteria you need to follow, but generally speaking visual effects and camera movement should help the viewer better segment information, not entertain them. For example, if text appears in segments, it should be done because the viewer needs to examine each segment in isolation and not be overloaded with all the information at once. The appearance of each segment should be synced with the audio if it is present, and the pause between each segment should ideally be equal.

3.3 Positioning of information

Video is a two-dimensional medium, even if it can demonstrate three-dimensional space. Information and points of attention are always arranged on a 2D plane, and it is important to make sure that the video is structured in such a way that helps to navigate it most efficiently. If you are displaying something at one corner of the screen, it is not a good idea to make the opposite corner the focus of attention in the next shot. The less the viewer needs to shift their attention along the screen the better, especially if there is little reason to make them do it. Generally speaking, any advice about the giving a presentation is also helpful when making a video, from the choice colors to the choice of fonts and

positioning of elements. For example, the closer to the edge something is, the more difficult it is for the viewer to see it clearly without additional effort.

3.4 Audio

If you choose to include voiceover or speaking in general, it is important to do it properly. Your speech needs to be clear and of high quality, both in purely technical, but also in presentational sense. For technical quality - make use of high-quality microphones, don't forget the pop filters, ensure quiet environment and prepare to do several takes. If you can't get a good microphone, dedicate some time to testing the ones you have and seeing which one is better and how you can mitigate its downsides - experiment with noise suppression levels, microphone position, etc.
For presentational quality - speaking for an audience, be it as part of education or product presentation, is a separate and valuable skill, which comes with practice. Don't forget to stretch your vocal muscles before recording, do a couple test takes, and remember that the way your voice sounds in a recording is always different from the way you hear it - see what tone and tembre sounds best with your equipment. Finally, remember that you are speaking with the goal of being heard and understood - speak clearly, try not to rush, and remember that pauses are an instrument of directing attention. When the speaker pauses, the viewer can pay more attention to what is happening on the screen and has time to process what has been said. Pauses are also useful for separating informational blocks - when you cover several topics in one video, don't immediately jump from one to the next, but instead give your viewer a moment to switch their attention. This can be done by using a title card for the next topic and pausing your narration for a moment.
Finally, very importantly, if the format allows it, always try to include subtitles. This is helpful to many more people than you think! And remember, readability before aesthetics - the goal of subtitles is to be easy to read, not look nice. Always follow general readability guidelines (simple large font, high contrast, preferably white text against a dark background)

3.5 Getting the footage

Some video segments are easier to get than others. Screen capture just requires any screen-capturing software tool, and both stationary and mobile devices already have this functionality built-in.
Filming people or objects and environments is more difficult. While a lot of advice for this scenario is tied to the equipment you are using, there are still some general principles that you might want to keep in mind.

1. **Background** If your background isn't meant to convey any information or evoke some association in your viewer, it is often better to choose a neutral and simple background. Even if you want to film someone or something in a realistic environment, don't hesitate to remove things the viewer would

find distracting or irrelevant. To put it simply - if you want to film an interview at someone's desk, clean it up first.

2. **Audio** Recording audio in a studio with a good microphone is very different from trying to do a live recording somewhere else. Be prepared to clean the audio up, do some tests in advance, and potentially re-record some segments. A good practice is recording a background noise sample in the environment you are filming in, as many programs have a function of automatic noise removal if you have a recording with an example of what to remove.

3. **Positioning the camera** Handheld is not an option for any serious project. Your camera needs to be stable and easy to control. In general, but especially if you want to pan the camera across something, shift the focus or otherwise adjust some parameters throughout filming, you will need an appropriate stand. And finally - don't hesitate to consult the basics of framing, available online. Good framing is important for presentation.

4. **Stock footage** Sometimes stock footage is a useful resource, when you don't have a lot of time or need to illustrate a specific concept and attract the viewers attention. But make sure you have the right to use it in your project and remember that the informative quality of stock footage is usually pretty low - if you have a specific idea in mind, it is always better to get the footage yourself.

5. **Live streaming** If you want to record something you do during a live stream, be it a lecture or a presentation, remember that the this adds complexity to every other element of the filming process. You will need to set up a good capturing system, think about how you are going to manipulate the recording systems on the fly, and so on. This is highly equipment specific, but in general - think twice if you really need to do something live, when you can pre-record and edit it if necessary.

After you have planned your video and recorded all the necessary audio and footage, it is time to put it all together in editing. You can do that in any program you are comfortable with, but if you are uncertain where to start, we can offer a few recommendations.

4 Software Tools for Video Recording and Editing

4.1 Basic editing

Whatever OS you are using, it is almost certainly comes with a basic video editor, such as Clipchamp for Windows or iMovie for Mac. This software is sufficient for basic editing, such as combining voice over track with visuals, trimming and cutting the clips, and so on. Below we briefly outline several alternatives, if you want a broader functionality.

4.2 OBS Studio

OBS Studio (Open Broadcaster Software) is a popular free and open-source software used for video recording and live streaming. It offers advanced features and full control over the recording process. It is used both by professionals and by those new to filming and streaming. Some of the key features include:

4.2.1 Key Features of OBS Studio for Educational Video Creation

- **Cross-Platform Compatibility**: OBS Studio is available on Windows, macOS, and Linux, providing accessibility for all users.
- **High-Quality Capture with Low System Impact**: Captures high-quality video and audio with minimal performance impact, suitable for tutorials and gaming recordings.
- **Real-Time Video and Audio Mixing**: Allows for mixing multiple audio and video sources live, with customizable transitions, effects, and filters.
- **Scenes and Sources**: Users can create and switch between different scenes (e.g., screen capture, webcam) during recording for a dynamic presentation.
- **Customizable Layout and Controls**: Modular UI allows students to arrange OBS's interface to fit their workflow, with hotkey assignments for quick actions like switching scenes or muting audio.
- **Recording Formats and Quality**: Supports multiple output formats (e.g., MP4, MKV) and high-bitrate recordings suitable for 4K video.

4.2.2 Using OBS Studio for Video Recording

There are multiple tutorials available online, but the basic process for setting up your OBS for filming is this:

1. **Download and Install**: Download OBS from the official website.
2. **Initial Setup**: Use the auto-configuration wizard for optimized recording settings based on system hardware.
3. **Add Sources and Set Up Scenes**: Add sources (e.g., screen, webcam) in the "Sources" panel and organize them into scenes for easy switching during recording.
4. **Customize Settings**: Configure video resolution, frame rate, recording format, and audio settings for optimal quality.
5. **Start Recording with Hotkeys**: Begin recording with "Start Recording" and use assigned hotkeys for control over actions like scene switching.

6. **Preview and Edit Videos**: View recordings in the output folder; use external editors for trimming or enhancements as needed.

7. **Live Streaming (Optional)**: For live broadcasts, configure the "Stream" settings with a stream key from platforms like YouTube or Twitch.

4.3 OpenShot Video Editor

OpenShot Video Editor is a free, open-source video editing software that is designed to be simple to use while offering powerful features for video editing.

4.3.1 Key Features of OpenShot

- **Cross-Platform Accessibility**: OpenShot is compatible with Linux, macOS, and Windows.
- **Unlimited Tracks for Layering**: The software allows for unlimited tracks, enabling users to overlay multiple video, audio, and image elements to create dynamic and complex scenes.
- **Clip Resizing and Trimming Tools**: OpenShot provides intuitive tools for resizing, trimming, and scaling video clips within the timeline, making it easy to arrange and adjust footage.
- **Animation and Keyframe Control**: Powerful animation tools allow users to add motion to clips, transitions, and effects by setting keyframes.
- **Audio Waveforms for Synchronization**: The timeline displays audio waveforms, making it easier to synchronize audio precisely with video.
- **Chroma Key for Background Removal**: OpenShot's chroma key (green screen) feature enables background removal.
- **Support for Multiple Media Formats**: Through the FFmpeg library, OpenShot supports a variety of video, audio, and image formats, ensuring flexibility in media selection.

4.3.2 Using OpenShot for Video Editing

Again, there are multiple tutorials available online, which we would recommend you check out, but the basic process for working with this program is this:

1. **Download and Install**:
   Visit the OpenShot official website to download the appropriate version for your system, and follow the installation instructions.

2. **Starting a Project**:
   Launch OpenShot and set up a new project. Adjust project properties (resolution, aspect ratio, and frame rate) as needed. Import media files by dragging them into the media library or using the "Import Files" option.

3. **Editing on the Timeline**:
   Drag media files onto the timeline for editing. Use the timeline to cut, trim, and arrange clips. OpenShot's multiple tracks allow for easy layering and complex arrangements. Right-click to access basic editing options, such as splitting or duplicating clips.

4. **Applying Transitions and Effects**:
   Add transitions by dragging them from the transitions panel onto the timeline. Real-time previews show the transition effects. Apply additional effects (color correction, brightness, contrast) from the effects menu.

5. **Creating Titles and 3D Animations**:
   Use the "Title" menu to add text and title screens. For advanced users, OpenShot offers 3D animated titles integrated with Blender. Customize fonts, colors, and styles as needed.

6. **Exporting the Final Video**:
   Once editing is complete, click "Export" to render the video. OpenShot includes presets for various platforms (YouTube, Vimeo, etc.) and quality levels, simplifying the export process.

4.4 Kdenlive

If for some reason OpenShot Video Editor is not suitable for you, you can try Kdenlive (KDE Non-Linear Video Editor). It is a free and open-source video editing software designed to provide powerful video editing capabilities while still being user-friendly.

4.4.1 Key Features of KDNlive

- **Multi-Track Editing for Layered Content**: Kdenlive supports multiple video and audio tracks, allowing students to easily layer visuals, narration, and background music, which is essential for creating educational videos.

- **Variety of Effects and Transitions**: With a wide selection of built-in effects and transitions, students can enhance their videos with color correction, audio effects, and smooth transitions between scenes, improving the video's clarity and flow.

- **Cross-Platform Accessibility**: Kdenlive runs on Linux, macOS, and Windows, making it accessible to students regardless of their operating system.

- **Keyframeable Effects for Dynamic Control**: Many effects are keyframeable, allowing users to animate elements gradually for emphasis, which is helpful for drawing attention to important content.

- **Proxy Editing for Smooth Performance**: For high-resolution videos, Kdenlive's proxy editing creates low-resolution previews for smoother editing, especially beneficial when working with limited computer resources.
- **Flexible Media Format Support**: Supports a variety of video and audio formats, ensuring that users can incorporate different types of media into their projects seamlessly.
- **Customizable Interface for Efficiency**: The layout can be customized to suit individual workflows, enabling users to arrange tools and panels for quicker access to frequently used functions.
- **Comprehensive Audio Editing Features**: Kdenlive includes audio effects, multi-channel audio support, and controls for muting or adjusting volume, ensuring clear and balanced sound for lectures or tutorials.

4.4.2 How to Use Kdenlive

Similarly to other programs, there are multiple tutorials available online, but the basic workflow for the programm is as follows:

1. **Download and Install**:
   Go to the Kdenlive website and download the suitable version for your operating system. Follow the instructions to install.
2. **Starting a Project**:
   Open Kdenlive and start a new project. Set the resolution and frame rate based on your content requirements. Import your media files (video, audio, images) by dragging them into the media bin.
3. **Editing in the Timeline**:
   Place media files on the timeline to arrange them. Trim, move, and add additional layers as needed. Use the toolbar for precise cuts, extensions, or ripple edits, and layer video and audio to create an organized flow.
4. **Adding Effects and Transitions**:
   Drag and drop effects and transitions from the effects panel to enhance the video. Use keyframes to adjust effects over time, adding dynamic elements to the video.
5. **Audio Adjustments**:
   Adjust audio levels directly on the timeline or use audio effects (e.g., normalization, reverb) for professional-quality sound. Balancing audio is key to ensuring clear narration and consistent volume.
6. **Exporting the Final Video**:
   Click the "Render" button when the project is ready to export. Kdenlive offers preset options based on your chosen platform (YouTube, MP4, etc.), making it easy to publish.