

Producing Video Tutorials With Open Source Tools

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Motivation

- I've been teaching about 1.5 years
 - University of St. Thomas (St. Paul) Grad Programs in Software
- I needed to learn how to record my lectures
- I also needed to make software tutorials
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Goals

- Share experiences about making video tutorials and lectures
- Two-way sharing of experiences is ideal: please share your experiences as well

Overview

1 Intro

2 Use Cases

3 Techniques

4 Tools

5 Discussion

Outline

1 Intro

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Recording a Lecture

- A normal classroom experience but it's recorded
 - Students can consume lectures remotely if they are sick or travelling
 - Students can rewatch difficult material
 - Beneficial for English-as-a-Second-Language (ESL) students
 - Since my university provides classrooms equipped with recording tools and proprietary software, I won't go deep into this

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 - Sozi is a way to make animated presentations, e.g., this presentation about presentation

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Inspiration: Citizen Journalism

- Public citizens play the role of traditional, professional journalists
 - E.g. Arab Spring, Japan Tsunami, Ferguson unrest, Occupy Wall Street, Haiti Earthquake, etc.
 - Often relies on open source tools, new media platforms, and mobile phones
 - USC Annenberg project: a smart phone app that guides the user to record specific shots, in order to foster the creation of higher quality video content

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 - Especially useful for teaching software that has GUIs (graphical user interfaces)
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Video Editing

- Video editing involves cutting, arranging, and other transformations of video shots
- Editing is a big aspect of storytelling using video
 - Difference between plot and story
- Editing video tutorials can make your videos shorter

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How much value is added from footage besides screen and audio?

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B-Roll

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 - The main footage is called “A-Roll”
 - In our case the screen recording would be the A-Roll
 - B-Roll can be other video or still images
- Helps establish context and adds dramatic support
- Helps prevent jump cuts, i.e. two shots that are very similar that are edited to be temporally adjacent



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Source: <https://www.youtube.com/watch?v=KJLjyfzXWUw>



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5 Shot Sequence

- Combining A-Roll and B-Roll builds up shot sequences
 - Like software design patterns for cinema and television
- The “5-Shot Sequence” is a formulaic sequence in journalism composed of the following 5 shots

- 1. Establishing shot (ES) – sets the scene, provides context, and establishes the setting and mood.
 - 2. Reaction shot (RS) – shows a character's reaction to an event or action, often providing a contrast to the ES.
 - 3. Close-up (CU) – focuses on a specific character's face, expression, or detail, conveying emotion or information.
 - 4. Over-the-shoulder (OTS) – shows a character from behind, looking at something off-camera, creating a sense of intimacy or perspective.
 - 5. Handheld shot (HS) – uses a handheld camera to create a sense of movement, instability, or immediacy, often used for action or interview shots.
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 - A close-up of the face
 - A medium shot of the person talking
 - A wide shot of the person talking
 - A close-up of the hands
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Audio Synchronization

- If you are using multiple streams of video, you'll want to make sure that they are all synchronized
- It's easier to synchronize video using audio
 - Audio sampling rate \gg video sampling rate, so there is more resolution to work with
- A clap (impulse noise) can be used to mark the synchronization point

Tip

Two claps can be used to mark an error that you want to edit out.

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Room Tone

- If you record in different acoustic settings, the difference background noise (e.g., heating/ventilation, traffic, lights/electrical) will create noticeable changes when editing
 - This gives the video an unpleasant, amateurish feel
 - Especially noticeable when going from ambient recording to complete silence

Tip:

Record 30 seconds of “room tone” to smooth out audio during silences.

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Effort Estimation

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Tip:

Though it is difficult to estimate the time required to edit video, the effort required roughly increases with the ratio of input footage to output footage.

- Setting things up and rehearsing or having a script is much easier than trying to edit multiple takes

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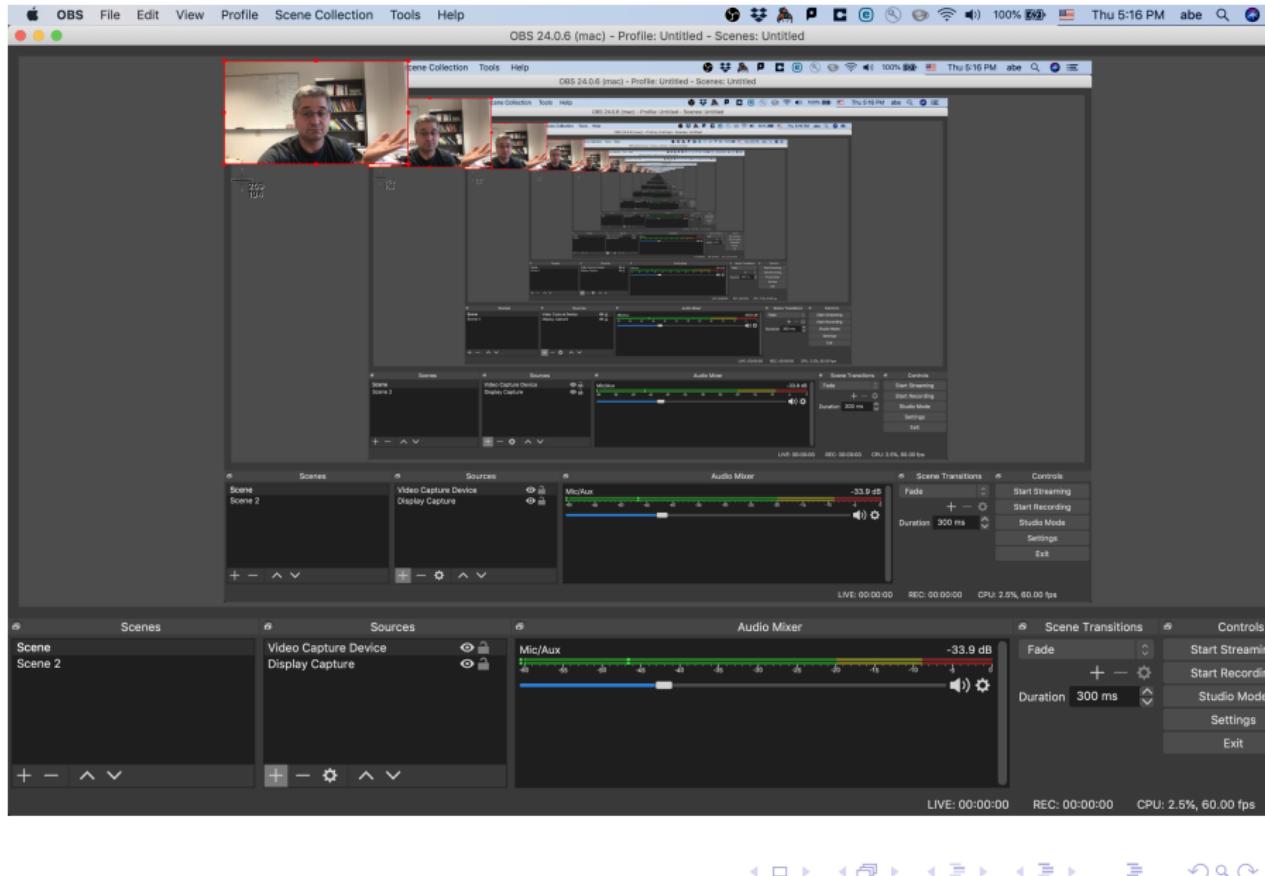
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- Open Broadcaster Software (OBS) Studio is an open source screen capture software
 - Has options for both screen capture and streaming (live screencast)
 - Sponsored by Twitch, among others
- Outputs a video file (mkv-format) or streams to a server
- Multiple sources are-mixed into a single file or stream

After a few days of using OBS Studio, I realized that I didn't need two streams. I could just have one stream and add my own video to it.

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- Another issue I had was showing the mouse when using window capture (as opposed to screen capture)

Tip:

To record mouse movements, use whole screen capture instead of individual window capture.

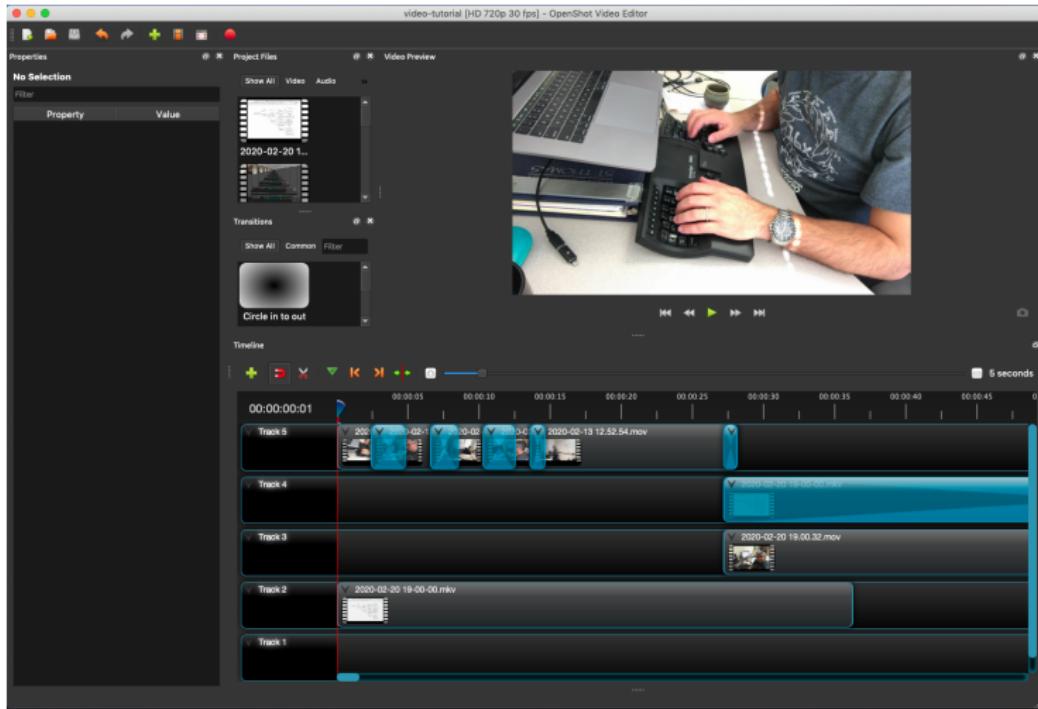
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OpenShot



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- Editing is necessary if...
 - you want to mix multiple video sources (e.g., 5-shot sequence)
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Smart Phone

- This is needed if you decide to produce B-Roll footage
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Tripod



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- A tripod will help with B-Roll footage if you are producing the video by yourself
- There are many options for “selfie” type tripods for phones
 - Comes with Bluetooth remotes for starting/stopping recording
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The screenshot shows the Sozi application window. On the left, there is a large white canvas area where a flow diagram is displayed. The diagram consists of several rectangular nodes connected by arrows, representing a process flow. The nodes are labeled: brain, idea, editor, distill, commandline, svgimage, sozi, htmljson, and browser. Arrows indicate the flow from brain to idea, idea to editor, editor to distill, distill to commandline, commandline to svgimage, svgimage to sozi, sozi to htmljson, and finally htmljson to browser.

On the right side of the window, there is a sidebar containing several configuration panels:

- Frame**:
 - Title: New frame
 - Id: frame6385
 - Timeout (seconds):
- Layer**:
 - Copy layer: Select a layer to copy
 - Outline element Id:
 - Layer opacity: A slider set to 100%
- Transition**:
 - Duration (seconds):
 - Timing function: Linear
 - Relative zoom (%):

At the bottom of the window, there is a toolbar with various icons for file operations like Open, Save, Print, and a preview icon. Below the toolbar, there is a row of buttons numbered 1 through 13, each followed by the text "New frame". The button for frame 13 is highlighted with a teal background. At the very bottom, there is a footer bar with navigation icons for back, forward, search, and other document-related functions.

Sozi

- **Sozi** creates animated diagrams from SVG images for snazzy presentations
 - Given SVG image(s) create animations that pan, zoom, and rotate using the images as layers
 - Open source version of Prezi
 - www.sozi.org
 - See demo video tutorial @ t=769

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- Generates graph diagrams from a declarative specification
- Used to create the SVG input to Sozi
- Consists of a graph specification language, DOT, and command line tools to generate/render output graphs
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Graphviz

The screenshot shows a terminal window with several tabs open. The active tab, titled '1. emacs-26.2', contains the following content:

```
# brain -> idea -> editor -> dotfile -> commandline ->
# svgimage -> sozi -> htmljson -> browser

digraph sozi {
    rankdir = LR
    node [shape = record]

    brain -> editor [Label="idea"]
    editor -> commandline [Label="dotfile"]
    commandline -> sozi [Label="svgimage"]
    sozi -> browser [Label="htmljson"]

}
```

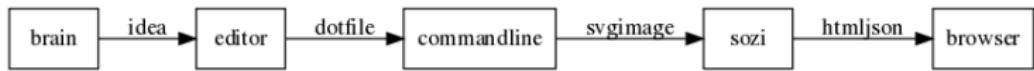
The status bar at the bottom of the terminal window displays the following information:

-UU-:----F1 sozi-process.dot All L1 Git-master (Fundame

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LATEX/Beamer

- LATEX and Beamer were used for this presentation slides
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Outline

1 Intro

2 Use Cases

3 Techniques

4 Tools

5 Discussion

Acknowledgements

- Matthew Lynn: visual effects specialist
- Melissa Loudon, Andrew Li: citizen journalism inspiration
- Eric Level: teaching and classroom video
- SCaLE organizers, esp. A/V team

Discussion Topics

- Related experiences to share
- Questions
- Opinions:
 - Is extra footage apart from screen capture useful (e.g. talking head)?
 - Video tutorials vs text/readme
- If there's time, we can watch [the demo video](#) or drill down into specific topics