

Motivation

- I've been teaching about 1.5 years
 - University of St. Thomas (St. Paul) Grad Programs in Software
- Before that, software industry here in Southern California
- I needed to learn how to record my lectures
- I also needed to make software tutorials
- I wanted to use Open Source tools

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

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

“Flipped” Lecture

- Normal lecture: lecture in class, homework/project at home
- “Flipped” lecture: recorded lecture watched at home, homeworks and projects in class.
- Seems like a good idea but I didn't have any video recording or editing skills

Video Tutorial

- Video tutorials illustrate a skill using video instead of text
 - Our scenario: the tutorial is about using some software so the base case is screen capture + voice
 - I'll be using this case as an example:
 - Example video posted on [YouTube: how to make a Sozi animation](#)
 - Sozi is a way to make [animated presentations](#), e.g. [this overview of my presentation](#)

Inspiration: Citizen Journalism

- Public citizens play the roll 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

Video Screen Capture

- Video screen capture is a recording of the screen and usually includes audio narration
- Useful for demonstrating features of software
 - Especially useful for teaching software that has GUIs (graphical user interfaces)
 - Also useful for filing bug reports
- By default, screencasts are real-time, but after-the-fact editing can be useful
 - Fixing mistakes, shorten the video
 - Adding other footage to make it more interesting, e.g. a talking head

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
 - Saves your viewers' time...
 - ...but costs you your time

Open Question

How much value is added from editing and adding other footage besides screen+audio?

Shot Sequences

- 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 A close-up of the hands
 - ② A close up of the face
 - ③ A wide shot of the environment with the subject in it
 - ④ An over-the-shoulder shot showing the action from the subject’s perspective
 - ⑤ A creative shot to capture an unusual perspective or something else the viewer should know
- I was inspired by an app done by Melissa Loudon and Andrew Li at USC Annenberg School of Communication and Journalism
- [Example](#)

Animation

- Screen capture of is itself a type of animation
 - E.g. mouse/cursor movement and slide shows
- Sozi is an open-source version of Prezi, which uses an SVG canvas to build animated presentations
- Otherwise animation is a large topic and we won't cover animation outside of screen capture

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

Room Tone

- If you record in different acoustic settings, the different background noise creates noticeable changes when editing
 - E.g., heating/ventilation, traffic, lights/electrical
 - 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.

Microphone

- An external microphone will help record better audio
 - If you use your computer microphone, you may hear typing noises, especially for software tutorials

Microphone



Clapper



OBS Studio

The screenshot displays the OBS Studio interface on a Mac. The main preview window shows a recursive view of the OBS application itself, with a red box highlighting a smaller instance of the same window. The interface includes a top menu bar with 'OBS', 'File', 'Edit', 'View', 'Profile', 'Scene Collection', 'Tools', and 'Help'. The main area is divided into several panels: 'Scenes' (showing 'Scene 2'), 'Sources' (showing 'Video Capture Device' and 'Display Capture'), 'Audio Mixer' (showing 'Mic/Aux' at -33.9 dB), 'Scene Transitions' (set to 'Fade' with a 'Duration' of 300 ms), and 'Controls' (with buttons for 'Start Streaming', 'Start Recording', 'Studio Mode', 'Settings', and 'Exit'). The bottom status bar indicates 'LIVE: 00:00:00', 'REC: 00:00:00', and 'CPU: 2.5%, 60.00 fps'.

OBS Studio

- **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

Tip:

To be able to record two separate files/streams (screen+webcam) using OBS Studio, you need to start two instances of OBS Studio, and start the second instance on the command line.

- The more I used OBS Studio, the more I realized having two streams wasn't necessary

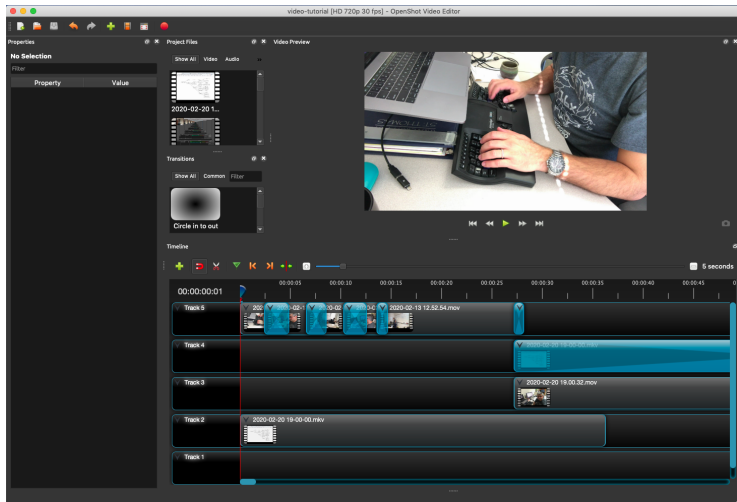
OBS Studio

- 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.

OpenShot



OpenShot

- **OpenShot** is an open source video editing tool
- Editing is necessary if...
 - ① you want to mix multiple video sources (e.g., 5-shot sequence)
or
 - ② you want to cut out unnecessary material (i.e., not live or real-time)
- Some editing type features are available when recording live from OBS Studio (e.g., switching from one scene to another)

Smart Phone

- This is needed if you decide to produce B-Roll footage
- Using a file synchronization service like Dropbox can make editing the B-Roll footage from the phone very convenient because it doesn't need to be manually moved to the computer

Tripod



Tripod

- 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
 - ~\$25

The screenshot displays the Sozi presentation software interface. The main workspace contains a flow diagram with the following steps: `brain` → `libx` → `editor` → `dettik` → `commandline` → `svtimage` → `sozi` → `html2ion` → `browser`. The right sidebar contains settings for the current frame and layer:

- Frame**
 - Title:
 - Id:
 - Timeout (seconds):
- Layer**
 - Copy layer:
 - Outline element id:
 - Layer opacity:
- Transition**
 - Duration (seconds):
 - Timing function:
 - Relative zoom (%):

The bottom status bar shows the aspect ratio as 4:3 and a sequence of 13 frames. The first frame is labeled "Default", and the 13th frame is labeled "New frame".

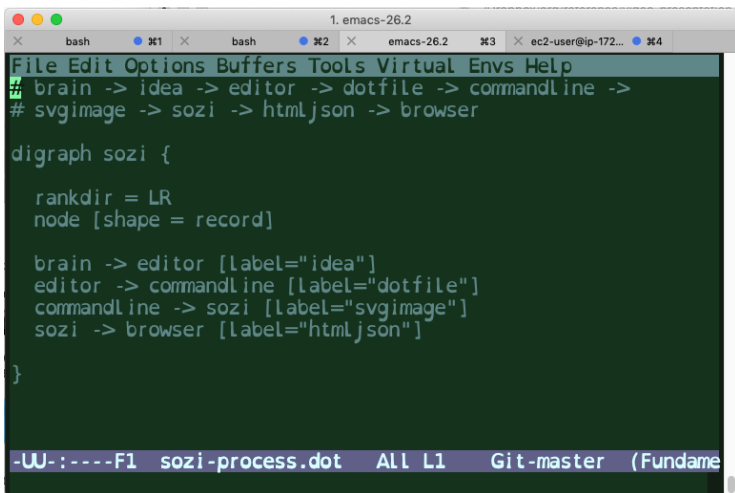
Sozi

- [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
 - User interface takes some getting used to: good candidate for a video tutorial
- [See demo video tutorial @ t=769](#)

Graphviz

- [Graphviz](#) is an open source graph visualization system
- 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
 - Also useful in the \LaTeX toolchain
- [See demo video tutorial @ t=204](#)

Graphviz



```
1. emacs-26.2
x bash #1 x bash #2 x emacs-26.2 #3 x ec2-user@ip-172... #4
File Edit Options Buffers Tools Virtual Envs Help
# brain -> idea -> editor -> dotfile -> cmdline ->
# svgimage -> sozi -> htmljson -> browser

digraph sozi {

    rankdir = LR
    node [shape = record]

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

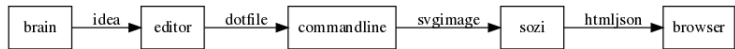
}

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

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L^AT_EX/Beamer

- L^AT_EX and Beamer were used for this presentation slides
- Fits more with the online lecture format but could also be used for video tutorial format
 - E.g., switch between the main screen (tutorial subject) and the slide deck
 - The slide deck can help keep a video tutorial on track

Conclusion

- It's fun and not difficult to make video tutorials with open source tools
- I hope that this presentation makes it easier to see a general lay of the land and one specific end-to-end example

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