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
- Before that, software industry here in Southern California
- 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
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Overview

1. Intro
2. Use Cases
3. Techniques
4. Tools
5. Discussion
Outline

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2. Use Cases
3. Techniques
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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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“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
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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
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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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- 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 GUls (graphical user interfaces).
  - Also useful for filing bug reports.
- By default, screencasts are real-time, but after-the-fact editing can be useful.
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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

Open Question
How much value is added from editing and adding other footage besides screen+audio?
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### B-Roll

- “B-Roll” refers to supplementary or alternative footage
  - The main footage is called “A-Roll”
  - Our case: the screen recording is 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

**Tip:**

Collect B-roll footage. B-roll footage can give context and depth to the video and it can break up jump cuts.
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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
    - A close-up of the hands
    - A close-up of the face
    - A wide shot of the environment with the subject in it
    - An over-the-shoulder shot showing the action from the subject’s perspective
    - A creative shot to capture an unusual perspective or something else the viewer should know

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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 > 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 in 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.
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Effort Estimation

- Effort estimation for video production seems to be similar to software engineering, i.e., it’s difficult to estimate

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

- Effort estimation for video production seems to be similar to software engineering, i.e., it’s difficult to estimate.

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Clapper
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

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To record mouse movements, use whole screen capture instead of individual window capture.
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OpenShot is an open source video editing tool

- Editing is necessary if...
  - you want to mix multiple video sources (e.g., 5-shot sequence)
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  - 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)
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- A tripod will help with B-Roll footage if you are producing the video by yourself.
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```plaintext
digraph sozi {

    rankdir = LR
    node [shape = record]

    brain -> editor [label="idea"]
    editor -> cmdline [label="dotfile"]
    cmdline -> sozi [label="svgimage"]
    sozi -> browser [label="htmljson"]
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```
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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
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
Conclusion

- It's fun and not difficult to make video tutorials with open source tools
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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