Technical Communication: Videos

EECS467 Autonomous Robotics Lab, W14

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What kind of videos?

- Short (about 3 minutes)

- Technical

  - Explain and demonstrate a method

  - (or) Make a claim and defend it

  - Video *should* have some technical meat!

- Audience

  - Engineers, but not subject-matter experts

  - Future EECS467 students

Structure

- 0:00-0:20   Bait

  - What is this video about?

  - Concise problem statement

  - Intriguing visual (perhaps a preview of the demo)

  - An unobtrusive text-overlay of your names & affiliation

- 0:20-1:00   Hook 'em

  - A more careful problem statement, motivation. The 4 questions.

  - Explain what's especially cool about your work (why should the viewer care?)

- 1:00-2:30   Explain your method.

  - Overlaying a step-by-step demo with voice-over (story telling) is effective

- 2:30-3:00   Conclusion

  - Put it all together. Show the whiz-bang demo, or re-state your claim and expand on its implications

- 3:00-3:15   Credits and contact information

The 4 Questions

- What's the problem?

- Why is it important?

- Why is it hard?

- What did we do about it?

Filming- Equipment

- Use a tripod

  - No hand-held shots!

  - Want multiple perspectives? Use multiple cameras or multiple takes (no one will be able to tell!)

- Lighting

  - Hard to have too much (diffuse) light ==> better video quality

  - White balance

- Microphone

Filming Equipment: Cameras

- Consumer digital camcorders
  - Quite good quality these days!
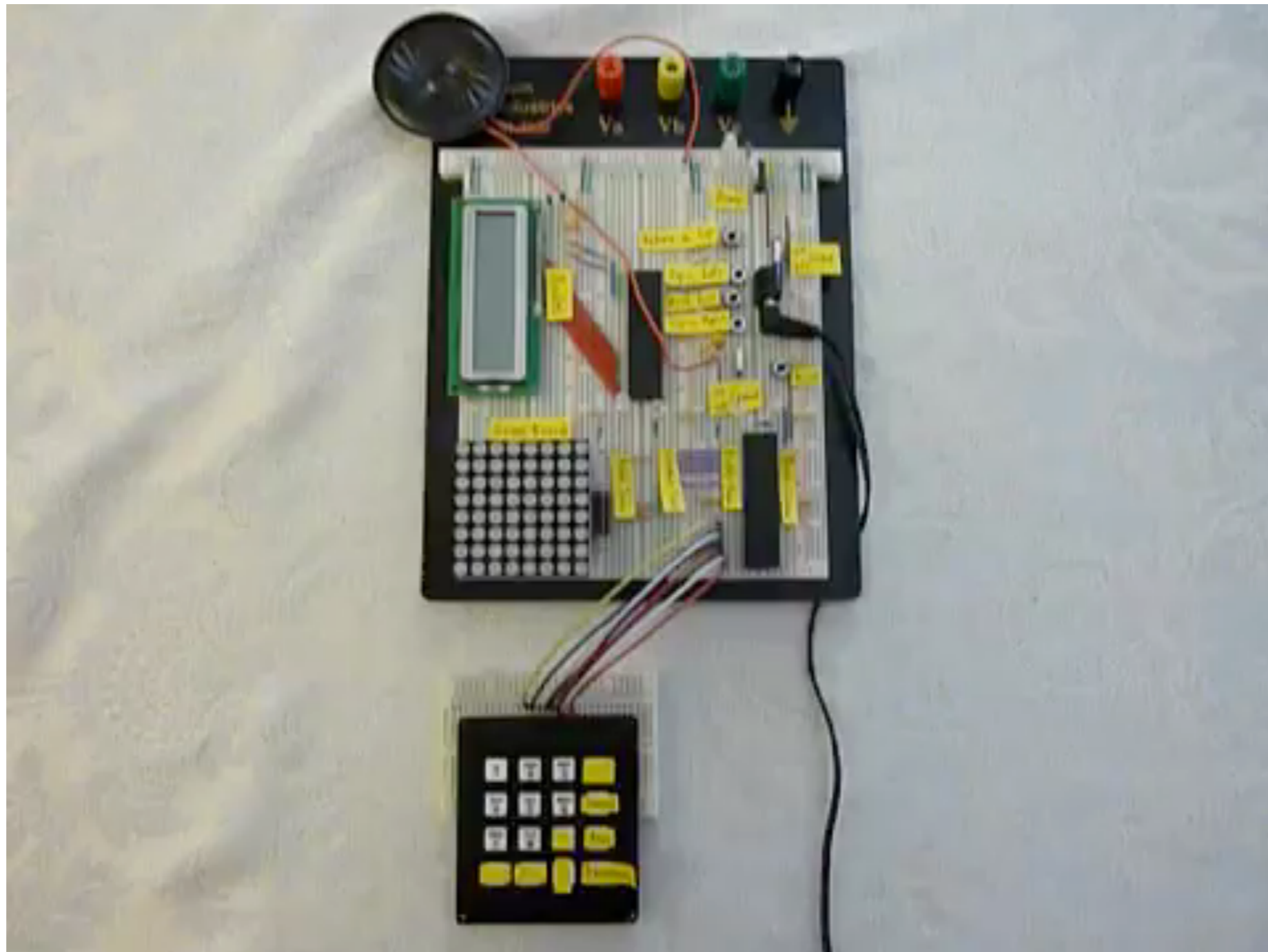 - Too easy to zoom/encourages sloppy ad-hoc video

- DSLR
  - Excellent quality
  - Really hard to zoom and focus simultaneously-- encourages good technique

- Cell phones
  - Useful in a pinch (better than missing a good shot)
  - Very small lens: lighting is critical
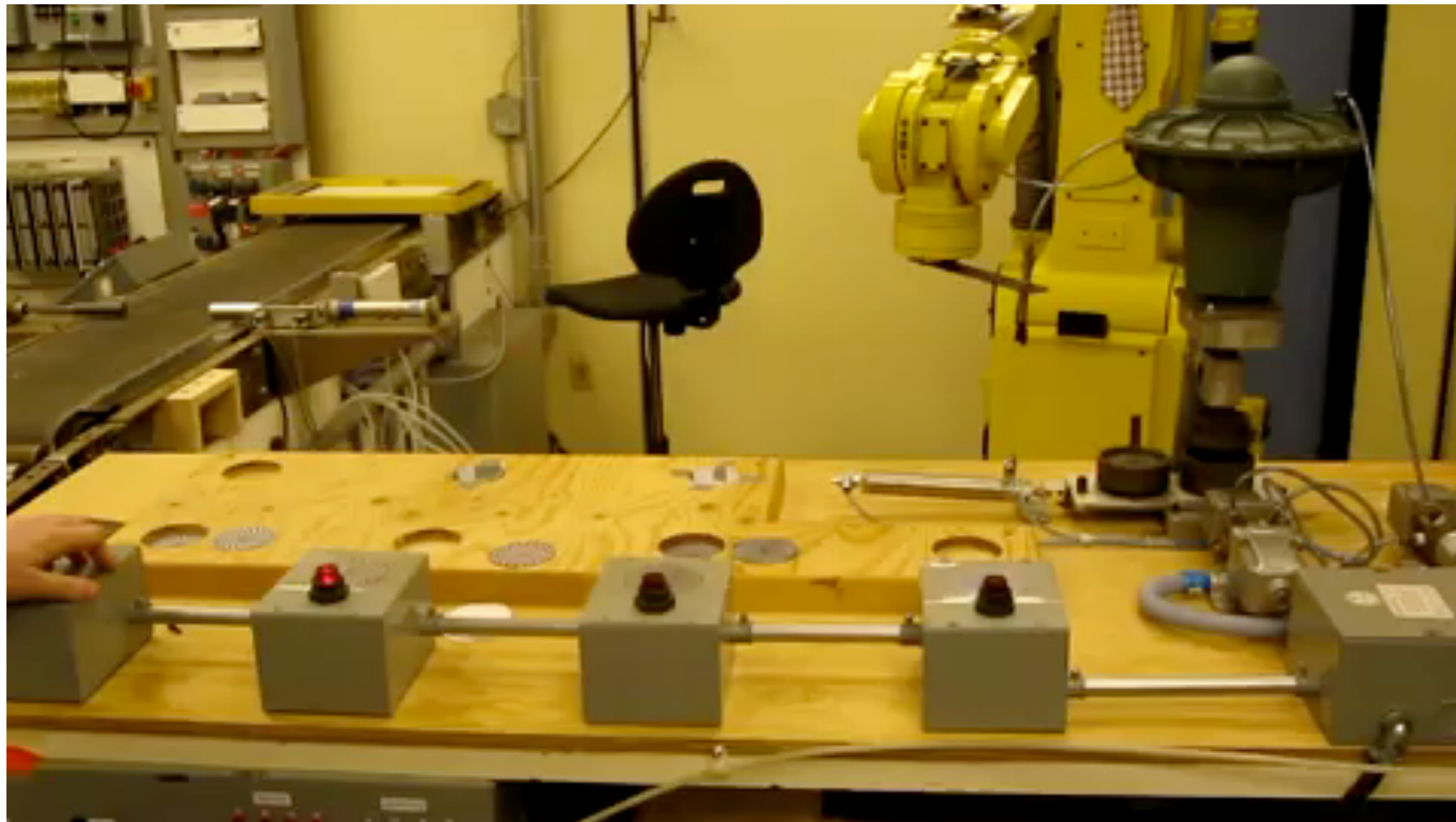 - Hard to put on tripod; brace against wall/table

(Anti-)Example

http://www.youtube.com/watch?v=M5zW58Ur1g8

Example

http://www.youtube.com/watch?v=7NfQlpUcATs

How-To: Lighting

http://www.youtube.com/watch?v=gkUqBJoxZ-I

Filming- Technique

- Don't zoom unless you are attempting to achieve a *specific* effect.
    - And your tripod probably isn't good enough to pan decently.

- Framing your subject doesn't mean *centering* your subject. (Rule of thirds). Give subject a space to look into.

- Ensure all cuts have a couple seconds of usable footage on either side
    - You'll need this padding for transitions

- Quality
    - Raw footage should be high bit-rate 1080/30, *progressive scan*

How-To: Rule-of-Thirds

Typical Process

- Write a voice-over script
  - And edit, edit, edit.
  - Have a rough idea of what video/images you'll use (storyboard)

- Record voice over
  - Use a high-quality microphone and set the gain correctly.
    - Make sure you can replicate recording conditions if you need to splice in edits.
  - Natural, conversational inflection
    - Not monotone, not radio-DJ

- Assemble a rough-cut of video
  - Get timings with the voice-over
  - You may decide to re-record portions of your voice over--- fine-tuning may be wasted effort.
  - Don't start with black/blank video or a fade-in --- results in useless thumbnails.

- Tweak and tune
  - Insert transitions, adjust video in/out
  - Add text overlays
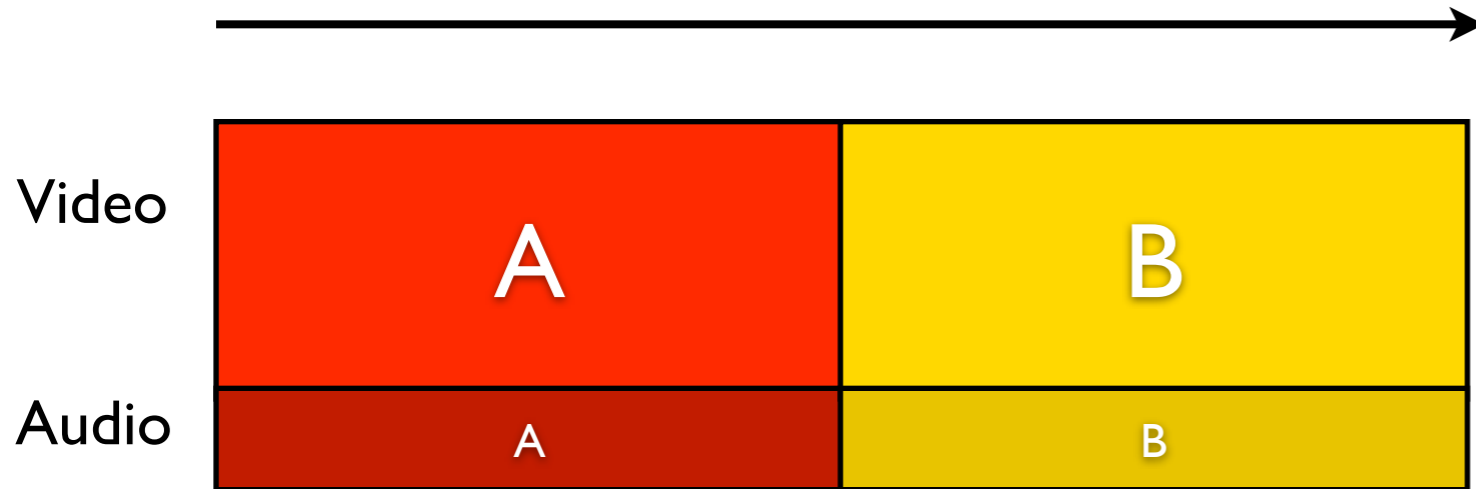
Editing techniques: Saving time

- Time is precious in a short video

  - Robots are slow

- Show excerpted action

  - Jump cut

  - Match cut
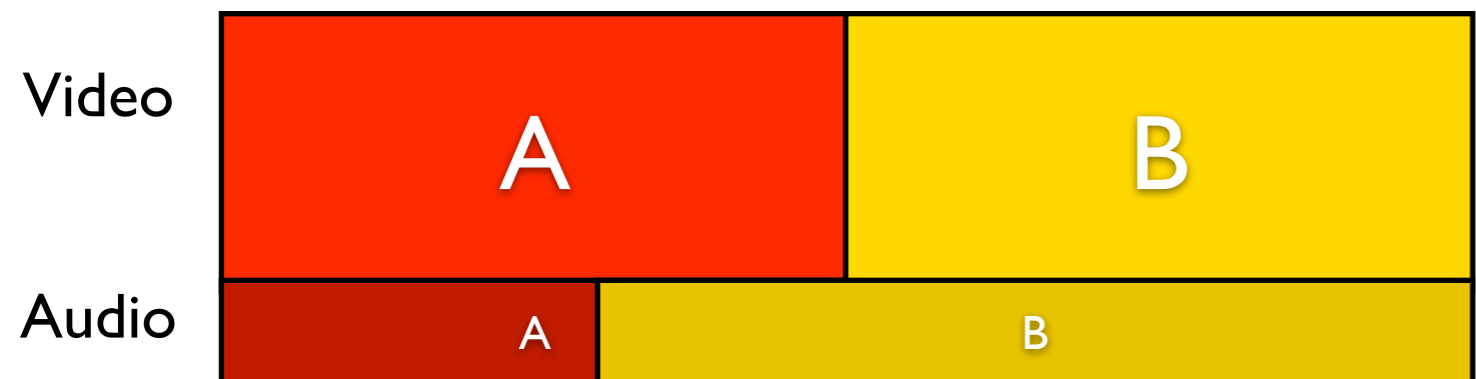
http://www.youtube.com/watch?v=ONMSe_zhq70
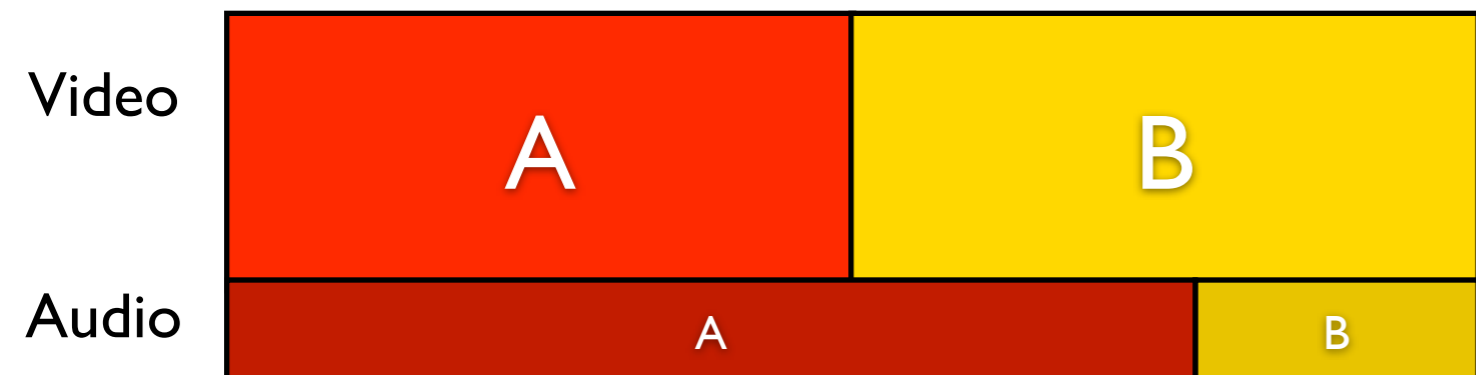
J-Cuts and L-Cuts

time →

Cut
Abrupt; can create a sense of motion (or disorientation)

J-Cut
Common use: establish a scene (wide-shot), L-cut to close-up

L-Cut
Common use: A close up (dialog or explanation), cutting to illustrative video

J-Cuts and L-Cuts Example

http://vimeo.com/20789680

The Editing Golden Rule

- The best cut is the cut that no one notices.

Style

- Avoid decorative transitions/wipes

  - The `comic sans` of video... star wipes.

  - Nobody ever got fired for a cross-dissolve

- Avoid template effects (including text-over) that is immediately identifiable

  - The "It's my first iMovie project!" look

- Talking heads: not a good use of "video real-estate" in a short technical video.

Example

http://www.youtube.com/watch?v=9LJ-Gn5BM7A

Example

http://www.youtube.com/watch?v=bo7Es3j5Egk

Example

Fast and Accurate Knife-Edge Maneuvers for Autonomous Aircraft

Andrew Barry
Anirudha Majumdar
Tim Jenks
Russ Tedrake

Huai-Ti Lin
Ivo Ros
Andrew Biewener

Robot Locomotion Group
MIT/CSAIL

Concord Field Station
Harvard University

https://www.youtube.com/watch?v=voN9CCmzxYk

Tools

- CAEN machines have Adobe Premiere

- iMovie is quite tolerable. Final Cut Pro fixes a few warts, but $$$

- Linux tools are awful :(

Final Result

- Encoded with HandBrake; h264 in mp4 container. (Universal preset should be good)

- Adjust quality/resolution so that output file is around 2-10 Mb/s

  - Total file around 50-200MB

  - YES: 1080p, 720p, 4:3, 16:9

  - No: 480i, 9:16.

- No YouTube, DropBox, etc. for submission

What to do now

- Start collecting video, still images, computer rendering.

  - Shove them in a folder for use later.

  - Make sure they are of usable quality.

B-Roll Bonus Material

http://www.youtube.com/watch?v=SltFvB0Upb8