Digital Jumpstart Workshops:

Audio

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What we’ll cover

- Part 1: The Audio Signal and Preservation
- Part 2: Audio Capture
- Part 3: Basic editing
What makes a good recording?

Let’s listen to a couple of recordings...

– Which is better, and why?
  - Let’s listen once just to the audio, then
  - Let’s listen and look at the wave forms

Sample 1

Sample 2
Part 1: The Audio Signal

Comparing the previous two...
Quality considerations

- During recording: (1) level (sampling rate)
  (2) Minimizing noise (ambient & machine)

- During capture: Sampling rate & Compression
  - Sampling rate (kHz + channels + bits (per second, per channel))
  - Compression: more or less “lossy”
  - Compression formats (e.g. mp2, mp3, .ogg, .wma)
    - “Lossless” formats (BIG!) for archiving, editing, hi-fi playback: mp4-als, Apple+ Win Lossless
    - “Lossy” formats (SMALL!) for online streaming, terr. radio: .mp3, .wma

- Bottom line: Samp= usually/at least 44.1 kHz, Comp= “less lossy”
  - Lossless or less lossy formats: .aiff (Mac), .wav (PC)
Open Audacity

(Audacity is free audio editing software)

- Open the sample audio file (...mp3)
- What is the sampling rate?
- How many channels (stereo or mono)?
- Is this a lossy or lossless format?
Workflow 1

- Recording – what your device can handle
  - Sound frequencies in kHz (kilohertz)
  - 44.1 kHz or higher for linguistic/musical work
  - (22 kHz - ok for some work)

- Capture – data transfer to computer
  - Memory cards (> USB) > computer
  - If your device is not digital – conversion from analog to digital, then capture
Workflow 2: formats/tasks

- Working – high- or average quality format
- Archiving – uncompressed formats
  - *Uncompressed/less compressed* formats best
  - Allows repurposing in future
- Presentation (web, CD, etc)
  - *Compressed* formats often better
  - Faster downloads, take less space
Devices and Compression

- Strongly recommended: lossless digital
  - solid-state recorder (CF/SD)
  - Archive Formats: .wav, aiff, (.au)
- Not recommended: MP3 recorders, dictaphones, cassette recorders
  (may be ok for non-archival quality interviews)
- Switch default settings from mp3 (usually 32 kHz) to 44.1 kHz - newer iPods, others
(A note on analog recordings)

- We all have analog cassette recordings
- If you have them, preserve them asap! (eg in Ctr for DInital Scholarship)
- These are fine:
  - as “heritage/legacy” materials
  - if you don’t have access to a digital device
- But for future recordings, ideally, we’d recommend *digital recording in 44.1 kHz*.wav format
Audio Editing

- Keep a pristine (unchanged) *original* version
  - LOCKSS (lots of copies keeps stuff safe)
  - You or others may want to go back to the original

- First, *save* a copy with a new name
  - Rename the file with a unique, concise, and explanatory label
  - develop your own system; recommend is date, lg code etc.
Playing, Selecting, Cutting, and Pasting
- To chop one file into two sessions
- To excerpt a portion (segment/clause/utterance) for presentation

Exercise: cut a portion out of your recording and save it as a new file – play this file
- Icons or Shortcuts: Cntrl-X [ct] or Cntrtl-C [copy]
- File-New, Cntrl-V [paste] -- then save under a new name
- Other: Cntrl-t [Trim, removes material outside the selection], Undo, Trim Silence selection (e.g. to remove a long pause or goat noises from recording
Navigating in Audacity

- Shortcut: [spacebar] = play
- Zooming in and out
  - use the (+/-) magnifying icons
  - Can zoom whole recording or a portion
  - Helps find boundaries to select and/or cut
- Practice “looping” a sound
  - Helps us find boundaries + do transcriptions
  - With the mouse, select part of the recording
  - Press Shift + play button
Exercise: Audio editing

From your recording, chop the following:
- Two whole utterances
- Any two words from these utterances
- Any two sounds

Sometimes this process can be automated, if there are pauses between items (e.g. word lists, musical pieces)
Types of Software

Consider: *Proprietary* ($$$, code is business secret) vs. *non-proprietary* (usually free, open source); platform

- Audio editing
- Audio analysis
  - Acoustic (e.g. phonetic) analysis - Spectrogram, f0, intensity
  - Time-linking + annotation (audio only)
  - Time-linking + annotation (audio + video)
I have a bad recording...

- Too quiet (levels too low) – hard to hear
- Too loud – “clipping” (seen here)
More advanced Signal processing

- Noise removal (see next slide)
- Conversion wav to mp3 (“Lame” plug-in)
  http://audacity.sourceforge.net/help/faq?s=install&item=lame-mp3
- Amplifying
- Concealing identity
Enhancement

- First: Save file under a different name!
- Extraneous noise: delete (Cntrl-X) or insert silence (Cntrl-L)
- Enhancing low-volume digital recordings
  - maximize signal-to-noise ratio (wanted/unwanted sound data)
- Analyze – Silence Finder – Export Labels (silences)
Recap

- **Audio signal**
  - Record and archive at highest possible quality;
  - Share in compressed formats (for eg internet)

- **Audio capture**
  - Transfer without (further) loss
  - Archive in a non-lossy format (never mp3)

- **Audio editing**
  - ALWAYS first save *and archive* a copy that is unenhanced, lossless, and stored in a non-proporietary format (or quasi-open such as .wav or .ale)
  - LOCKSS (Lots of Copies Keeps Stuff Safe)