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Description: This file describes the organization of the dataset (wav files) and code for laugh synthesis.

- The top-level URL that hosts dataset and code is https://ccrma.stanford.edu/~jieun5/laughter/
- From this page, click on either "DATASET" OR "CODE" to access a drop-down menu for each category.

I. DATASET

I.A. freely composed:
- Provides 10 wav files generated using our synthesis system’s “score mode”, used in the preliminary listener evaluation of our synthesis system. (Direct URL: https://ccrma.stanford.edu/~jieun5/laughter/dataset/freely_composed/)
- Provides wav files generated using the stimulus generator version of our synthesis system.

I.B. template ###:
- Provides wav files generated using the stimulus generator version of our synthesis system.
  - In the current implementation, the 3-digit template number works as follows:
    - 1's place: number of laugh-notes to be synthesized
    - 10's place: inhalation intensity
    - 100's place: default tempo
  - For example:
    - template 430 comprises of 4 laugh-notes (4) with clearly audible inhalation (3) and very fast tempo (0); and
    - template 307 comprises of 5 laugh-notes (5) with inaudible inhalation (0) and fast tempo (1).

- file naming convention:
  - The first 3-digit number is the template number
  - The remaining name is a chain of one or more feature ID number(s) and their value(s).
  - For example:
    - 202-1_0.0000.wav has been generated using template 202, where feature ID #1 has been specified (modified) to take the value of 0.0000;
    - 430_1_40.0000-&-5_32.0000-&-12_-1.0000-&-13_1.0000.wav has been generated using template 430, where feature ID #1 takes value of 40.0000, feature ID #5 takes value of 32.0000, feature ID #12 takes value of -1.0000, and feature ID #13 takes value of 1.0000.

- Feature ID #s are defined in our implementation of our stimulus generator (https://ccrma.stanford.edu/~jieun5/laughter/code/stimulusGenerator/):
  - feature ID #1: pitch bending (default value: 4.0)
  - feature ID #2: initial note pitch multiplier (default value: 1.0)
  - feature ID #3: f0 (default value: 400.0)
  - feature ID #4: f0 fall rate (default value: 0.88)
  - feature ID #5: initial note length multiplier (default value: 1.0)
  - feature ID #6: inhale duration (default value: 100.0)
  - feature ID #7: sustain duration (default value: 0.0 + Tempo * 10.0), where Tempo is specified in the template number (1's place)
  - feature ID #8: inter onset interval (default value: 10.0 + Tempo / 30.0), where Tempo is specified in the template number (1's place)
  - feature ID #9: intensity (default value: 3.0)
  - feature ID #10: inhale intensity (default: Inhale), where Inhale is specified in the template number (10's place)
  - feature ID #11: phrase decay rate (default value: 0.85)
  - feature ID #12 (voice-timbre only): f1 (default value: 0.0)
  - feature ID #13 (voice-timbre only): delta f1 (default value: 0.0)
  - feature ID #14 (voice-timbre only): f2 (default value: 0.0)
  - feature ID #15 (voice-timbre only): delta f2 (default value: 0.0)

- timbre options:
  - I.B.1. SinOsc timbre: wav files of laughter-like stimuli, generated using SinOsc UGen in ChucK
  - I.B.2. FM timbre: wav files of laughter-like stimuli, generated using FMVoices UGen in ChucK
  - I.B.3. Voice timbre: wav files of original laughter stimuli, generated using a glottal waveform buffer and formant filters

- In addition, stimulus sets used in our perception experiments can be found through the following URL: https://ccrma.stanford.edu/~jieun5/laughter/dataset/stimuli/

II. CODE

All code has been written using the ChucK audio programming language: http://chuck.stanford.edu/

- II.A. Synthesis System
  - mode of performance:
    - II.A.1. score mode (https://ccrma.stanford.edu/~jieun5/laughter/code/lolol-prototype/score/)
    - Provides example scores of laughter-music, to be used with lolol-score.ck
    - An interface for real-time laughter performance using keyboard and trackpad interactions.
    - Provides example code ("recipes") for semi-automatic generation of expressive laughter; in the given implementation, laughter is triggered by pressing a number (1-9) on the keyboard, representing laughter intensity.

- II.B. Stimulus Generator
  - timbre options:
      - Stimulus generator for synthesizing laughter-like sounds using SinOsc UGen
      - Stimulus generator for synthesizing laughter-like sounds using FMVoices UGen
      - Stimulus generator for synthesizing laughter sounds using a glottal waveform buffer and formant filters