Lab Session 2

Summary

Today we annotate a speech signal with phoneme labels, using the Praat software. Annotation means identifying which part of the speech signal corresponds to certain events – here, the events are phonemes.

Background: Information on Praat

Homepage

http://www.fon.hum.uva.nl/praat

Tutorials

http://www.fon.hum.uva.nl/praat/manualsByOthers.html

Details on annotating signals in praat

- Will Styler's English tutorial (section 9),
- Pascal Lieshout's English tutorial (section 4), or
- Jörg Mayer's German tutorial (sections 4.1.1-4.1.3)

These tutorials can be found at the URL above.

Annotation

Starting praat

The quickest way to start `praat` on the IMS Linux machines is to start a terminal and type:

```
praat &
```

The & sign starts `praat` in the background, i.e. the terminal is not busy running `praat` but can still be used to interact with the system.

This lab exercise can also be done on your own laptop. In this case, please find

out the most convenient way to start `praat` yourself.

Open the sound file

Choose Open → Read from file… to open the following two files (you can select both in one go by holding the `<Strg>` or `<Ctrl>` keys when selecting the files):

```
/mount/studenten/MethodsCL/2019/Speech/Lab2/m4bs46p7.wav
/mount/studenten/MethodsCL/2019/Speech/Lab2/m4bs46p7_lab.TextGrid
```

This will create a `Sound` and a `TextGrid` object in the objects window. The sound object contains the audio signal, and the `TextGrid` contains the annotation.

For annotating the signal, we need to open `Sound` and `TextGrid` together: select both objects (you will have to use the `<Strg>` or `<Ctrl>` key to select both, or click and drag the mouse pointer).

Then open the two using the `View&Edit` button. This will open a new large window, the so-called `Editor`.

You should see the sound representation as a waveform in the top pane of the window. We will learn more about waveforms in the next sessions – we'll just accept it for today because we cannot get rid of it if we want to be able to play the sound.

You will most probably also see a so-called spectrogram in the pane below the waveform – it contains lots of different shades of gray. We will cover that in later sessions, too. If you find the spectrogram distracting, you can switch it off: click on the `Spectrum` menu in the menu bar at the top of the window, and make sure that `Show Spectrogram` is not ticked. (It doesn't hurt to leave the spectrogram there if you know what it is, but if you don't it's probably easier to get rid of it for now). In case you have left the spectrogram visible, you might also see a blue line for the so-called pitch contour (click `Pitch` and then deselect `Show Pitch` if you want to get rid of it, we'll talk abot pitch later, too).

For navigating around in the signal, there are buttons to zoom in and out at the bottom left corner of the window. The `sel` button is for zooming to a selection (selections are highlighted in light pink or light blue). Clicking on the bars underneath the signal plays the corresponding parts of the signal. The bars always reflect the current selection.

The annotations are at the bottom of the window. In this `TextGrid`, there are two tiers (two layers of annotation): a phones tier and a words tier. Clicking into an interval will select that interval in the sound. Alternatively, you can make selections in the signal by clicking and dragging the mouse pointer.

Annotate the signal

The signal is an utterance from the Boston radio news corpus. This corpus consists of recordings of radio news plus phoneme and word annotations and more. Some of the annotations were generated manually, some automatically. I've taken the official annotation from the corpus for this example, with minimal changes. I've left the boundaries for phonemes annotated, but I've removed the phoneme labels. For your convenience, I've left the words :-)

It is your job today to write the phoneme labels **in ARPA or IPA notation** into the corresponding intervals. Use the handout with the phonemes for American English, or refer to Jurafsky/Martin. For writing or editing labels, just click into the interval, then type (or hit `Backspace` and/or the Arrow keys). If you want to use IPA, you can display a table of all non-ascii IPA symbols in the `Editor`: just click on `File → Preferences`, and then select: `Show IPA chart`. When the table is displayed, and you have selected an interval in your `TextGrid`, clicking on the IPA symbol will copy it to the interval in your `TextGrid`.

If you're unhappy with the boundaries as provided: it's possible to move boundaries by dragging them with the mouse. They can also be removed (by selecting `Boundary → Remove` from the menu). Insert boundaries (if necessary) by clicking into the waveform at the point where you want to create the boundary. This give little circles at the corresponding place in all tiers. Clicking into such a circle in some tier will create the boundary in that tier. However you might also just be happy with the version provided. There's always subjectivity in such annotations, so you can almost always argue for a better/different version. Welcome to speech research… :)

While you are working, save the `TextGrid` from time to time by `<Ctrl>-s` (or `<Strg>-s`), or by the command `Save TextGrid as text file...` in the `File` menu. While you are working, you are actually changing the `TextGrid` object, which is visible as an entry in your `Objects` window. If you happen to close the `Editor` window without saving the `TextGrid`, you can simply reopen it, without losing any changes. **However if you close the `Object` window, this will close `praat`, and unsaved changes are lost.**

So don't forget to save your `TextGrid` when you are done, and optimally also from time to time while you are working. This can be done either in the `Editor` as described above, or by selecting the `TextGrid` object in the `Objects` Window when you are done, then selecting `Save → Save as text file...`

If you are working on a laptop, upload the file in which you have save the `TextGrid` to your IMS account – we might use it in a later session.