

# Spraakherkenning en synthese (sep-dec 2008)

## Assignment 2: Formant frequencies

Use your sentence from assignment 1.

View the sound in the editor and determine pitch (F0) maxima and minima. (select the sound, click `Edit...` and, in the Pitch menu of the sound editor, click `Show pitch`). On which words do you find local maxima? Where inside the word?

Determine the spectrum of a segment of a monophthong vowel and draw it in the picture window (select the vowel segment; `File>Extract selected sound; To Spectrum...`; Edit the spectrum).

Click `Formant>Show formants` in the sound editor. Compare the formant frequencies of this vowel with the peaks in the spectrum.

Determine the formants at the center of all (at most 10) monophthong vowels.

Compare the measured formant frequency values with a reference.

For female speakers of Dutch, reference positions of F1 and F2 can be obtained by the following sequence of commands.<sup>1</sup>

```
1 | # next command is the ‘‘New>Tables’’  
2 | Create TableOfReal (van Nierop 1973)... no  
3 | # next command is in the ‘‘Multivariate statistics’’  
4 | To TableOfReal (means by row labels)... no  
5 | # next command is in ‘‘Draw -’’  
6 | Draw scatter plot... 1 2 0 0 200 1200 500 3000 12 yes + yes
```

Reference positions for male speakers can be obtained by substitution of ‘‘Pols 1973’’ instead of ‘‘van Nierop 1973’’ in line 2 of this script.

Describe your experiences concisely.<sup>2</sup>

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<sup>1</sup>All actions that you normally perform interactively with a mouse can also be performed by a script. This script shows the sequence of buttons that you have to click. In each script line the arguments from left to right follow the arguments in a form from top to bottom. Every button text in Praat that ends with three dots (...) will show a form when clicked. Lines that start with ‘‘#’’ are comments. For example, line 2 says that you have to click the button ‘‘Create TableOfReal (van Nierop 1973)...’’ from the Tables option in the New menu. In the form that appears the option must be turned off. This is indicated by the argument ‘‘no’’ in line 2.

<sup>2</sup>Hand in your assignment in BlackBoard’s Dropbox as a pdf file. The name *must* conform to <studentnumber>\_assignment01.pdf. For example, Jan Janssen with student ID 123456 delivers as 123456\_assignment01.pdf.