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# BID.praat
# Written by: Yi Xu 2/12/13
form Start
  integer Ifile 1
  real step_size 250
  real band_size 500
endform

directory$ = "./"
Create Strings as file list... list 'directory$'*.wav
numberOfFiles = Get number of strings
if !numberOfFiles
  Create Strings as file list... list 'directory$'*.WAV
  numberOfFiles = Get number of strings
endif
if !numberOfFiles
  exit There are no sound files in the folder!
else
  Write to raw text file... 'directory$'FileList.txt
endif

hastitleline = 0
for ifile from ifile to numberOfFiles
  select Strings list
  fileName$ = Get string... ifile
  Read from file... 'directory$'fileName$
  starttime = Get start time
  endtime = Get end time
  name$ = fileName$ - ".wav" - ".WAV"
  titleline$ = "Filename"
  energy_titleline$ = "Filename"
  energyline$ = name$
  call BID 'fileName$'
  if !hastitleline
    filedelete Energy.txt
    filedelete Center_of_gravity.txt
    filedelete Harmonics.txt
    fileappend Energy.txt 'energy_titleline$'newline$'
    fileappend Center_of_gravity.txt 'name$' Center_of_gravity'newline$'
    fileappend Harmonics.txt Filename H1-H2* H1-A1* H1-A3*'newline$'
    hastitleline = 1
  endif
  fileappend "Energy.txt" 'energyline$'newline$'
  fileappend "Harmonics.txt" 'name$' 'h1_H2' 'h1_A1' 'h1_A3'newline$'
  fileappend "Center_of_gravity.txt" 'name$' 'center_gravity'newline$'
  select Sound 'name$'
  Remove
endfor

procedure BID file_name$
  center = step_size
  select Sound 'name$'
  To Spectrum... yes
  center_gravity = Get centre of gravity... 2
  select Sound 'name$'
  To Pitch... 0.02 30 600

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median_pitch = Get quantile... starttimeendtime 0.5 Hertz
for band from 1 to 15
  if !hastitleline
    energy_titleline$ = "'energy_titleline$'      'center'"
  endif
  floor = center - 0.5*band_size
  ceiling = center + 0.5*band_size
  select Sound 'name$'
  Filter (pass Hann band)... floor ceiling 100
  energy = Get power... 0 0
  energy = 10 * log10(50000*energy)
  energy'band' = energy
  Remove
  energyline$ = "'energyline$'      'energy'"
  center += 0.5*band_size
endfor

center = median_pitch
bandwidth = 2 * median_pitch
for band from 1 to 2
  floor = center - 0.5*bandwidth
  ceiling = center + 0.5*bandwidth
  select Sound 'name$'
  Filter (pass Hann band)... floor ceiling 100
  energy = Get power... 0 0
  energy = 10 * log10(50000*energy)
  h'band' = energy
  Remove
  center += median_pitch
endfor
h1_H2 = h1 - h2
h1_A1 = h1 - (energy2 + energy3) / 2
h1_A3 = h1 - (energy11 + energy12 + energy13) / 3
endproc

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