The function hdag executes the HDAG method proposed in [1] to improve the intelligibility of noisy speech signals.

This function requires
   The emd.m file provided by G. Rilling and P. Flandrin at
http://perso.ens-lyon.fr/patrick.flandrin/emd.html.
   The PEFAC F0 estimator files provided in http://www.ee.ic.ac.uk/hp/staff/dmb/voicebox/voicebox.html

Usage:
   procSignal = hdag(signalFile, voiced_regions, BW, gammachirpCoeff, gain);

where
  infile: input .wav filename
  voiced_regions: TXT file with regions of voiced speech (refer to the example file)
  bwFactor: Value that defines the filters bandwidth (default: 0.15)
  gammachirpCoeff: Gammachirp Asymetry Coefficient (default: -1)
  gainValues: Gain factors of the filtered samples with the following configuration:
     gainValues = [lowPitchGains ; highPitchGains];
     gain = 1.0 - for no amplification
     default values (for the first 10 filters):
        lowPitchGains = [14.0, 1.0, 4.0, 8.0, 4.0, 3.5, 3.0, 2.0, 2.0, 1.5];
        highPitchGains = [14.0, 1.0, 1.0, 4.5, 2.0, 3.5, 2.5, 2.0, 1.5, 1.5];

Reference:

    [1] A. Queiroz and R. Coelho, "Harmonic Detection From Noisy Speech With
    Auditory Frame Gain for Intelligibility Enhancement," in IEEE/ACM Transactions
    on Audio, Speech, and Language Processing, vol. 32, pp. 2522-2531, 2024},

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Contents of HDAG.zip:
hdag.m - the algorithm MATLAB file
README.pdf – this file
speech_sample.wav – a sample speech file corrupted by Babble noisy with SNR = 0 dB.
voicedInfo.txt – example file that defines, in ms, the initial and final time instants of each voiced region of the input speech signal
fsffe_HHTAmp.m – MATLAB file to improve the F0 estimation accuracy in the voiced segments of the noisy speech signal based on the FSFFE low/high pitch separation scheme.
ExampleHDAG – example MATLAB file.

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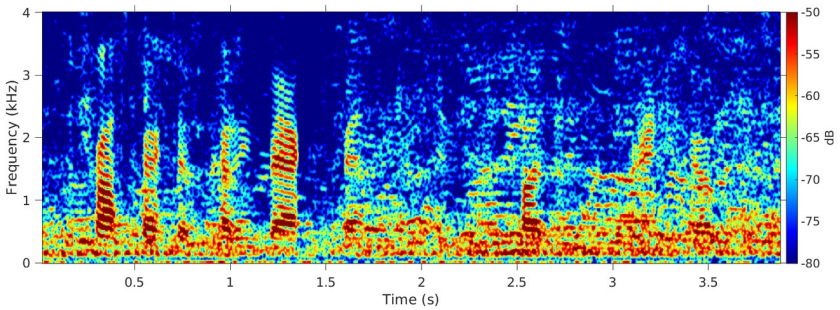
Spectrogram of the noisy speech sample:



Spectrogram of the noisy speech sample processed by the GTF_{F0} method:

