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

This function requires
The fsffe.py file for F0 estimation and low/high pitch separation
The PEFAC[1] 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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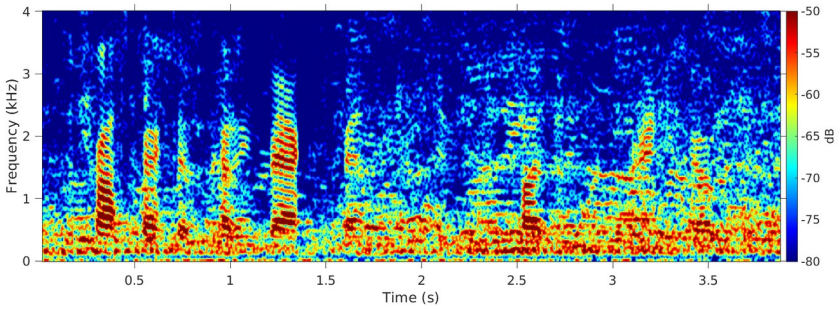
Spectrogram of the noisy speech sample:



Spectrogram of the noisy speech sample processed by the HDAG method:

