The function eifns executes the EIF-NS speech enhancement method proposed in [1] for speech corrupted by underwater noises.

This function depends on:

- emd.py file for the EEMD-IF decomposition
- ins.py file for INS calculation

Usage:

enhancedSignal = eifns(noisySignal, winLen=512, hopSize=256, imin=4, alpha=2.5, numSurrogates=5, numEnsembles=50, numIMF=8)

Parameters:

noisySignal : 1 dimensional ndarray
Noisy signal to be enhanced.
winLen : int, optional
Window length in samples. The default is 512.
hopSize : int, optional
Hop in samples. The default is 256.
imin : int, optional
Index of the lower IMF that will have frames removed . The default is 4.
alpha : float, optional
alpha parameter for EMD-IF. The default is 2.5.
numSurrogates : int, optional
Number of surrogates for INS calculation. The default is 5.
numEnsembles : int, optional
Number of ensambles for EEMD calculation. The default is 50.
numIMF : int, optional
Number of IMFs. The default is 8.

References:

[1] A. Caldeira e R. Coelho, "EEMD-IF Based Method for Underwater Noisy Acoustic Signals Enhancement in Time-Domain", IEEE Signal Processing Letters, v. 30, pp. 294-298, March 2023.

Contents of EIF-NS.zip:

- eifns.py – python file with eifns function
- eifns_test.py – example of eifns usage
- emd.py – python file with emd function
- ins.py – python file with ins function
- noisy.wav – noisy speech wav file example
- README.pdf – this file