This Matlab program implements the Multi-Resolution Cochleagram (MRCG) features described in

> Jitong Chen, Yuxuan Wang, and DeLiang Wang, "A Feature Study for Classification-Based Speech Separation at Low Signal-to-Noise Ratios", *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 22, pp. 1993-2002, 2014.

Please use the function MRCG_features.m to get MRCG features. For example,

```
features = MRCG_features(input_signal, 16000);
```

The two input arguments are time domain signal and sampling frequency.

Following is a description of the main steps in MRCG_features.m:

1. Given the input signal, generate Gammatone filterbank responses.

2. Compute the first cochleagram CG1 with the frame length of 20 ms and frame shift of 10 ms. A log operation is applied on each T-F unit.

3. Compute the second cochleagram CG2 with the frame length of 200 ms and frame shift of 10 ms. A log operation is applied on each T-F unit.

4. Compute CG3 and CG4 by averaging CG1 using 11x11 and 23x23 square windows.

5. Concatenate CG1-4 and append delta and double delta features.

Description of each function:

loudness.m
Compute loudness level in Phons on the basis of equal-loudness functions.

gammatone.m
Produce an array of filtered responses from a Gammatone filterbank

meddis.m
Produce auditory nerve response from output of a Gammatone filterbank

erb2hz.m
Convert ERB-rate scale to normal frequency scale

hz2erb.m
Convert normal frequency scale in hz to ERB-rate scale

deltas.m
Compute delta features

cochleagram.m
Generate a cochleagram from responses of a Gammatone filterbank

get_avg.m
Produce a smoothed version of cochleagram

MRCG_features.m
Compute MRCG features