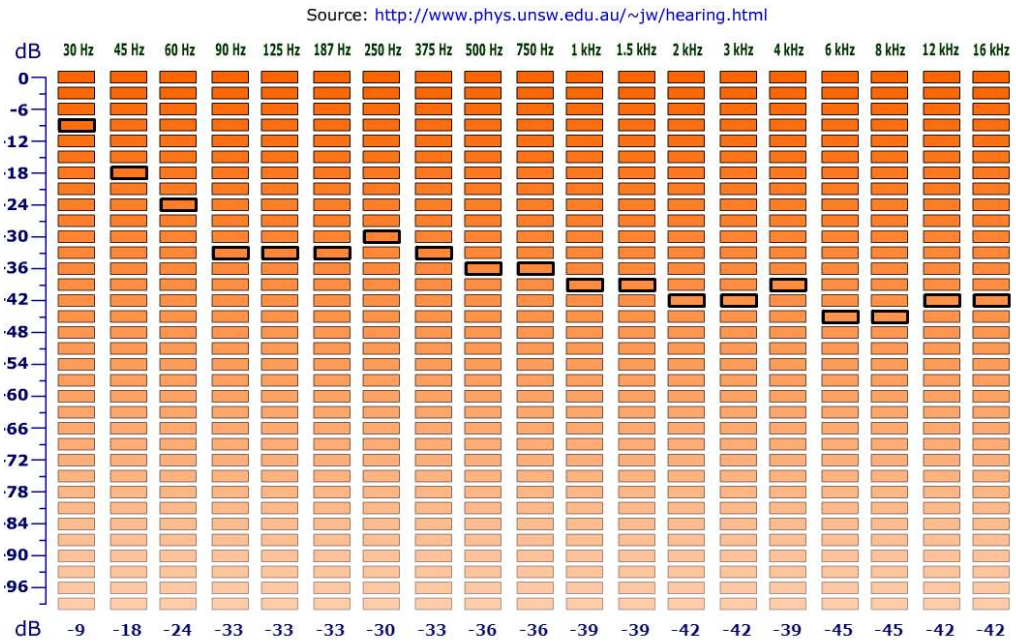

Southern University of Science and Technology

Speech Signal Processing

# Lab 2 Report

11510478 郭锦岳

# 1.1 Equal loudness contour

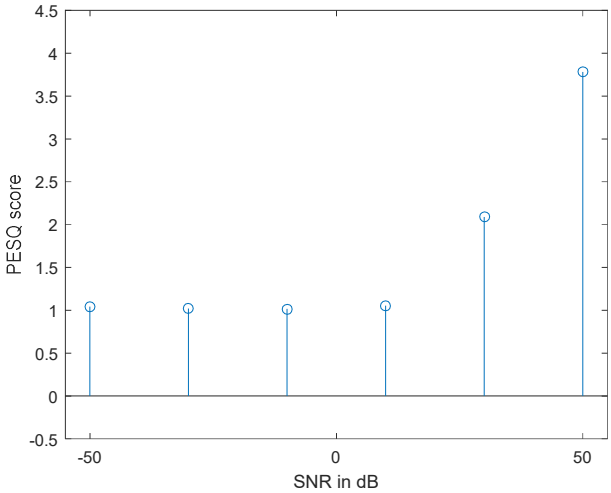


## 1.2 Objective Quality Measurement

```
% question 2
clear;clc;
[data,fs] = audioread('C_01_01.wav');
noise = zeros(6,length(data));
score = zeros(6,1);
%when dB set as [-5, 5], the score is almost the same,
%so I extended the dB range to get a clearer result.
db = [-50, -30, -10, 10, 30, 50];

for i = 1:6
    %generate the awgn noise signal with a certain SNR
    noise(i,:) = awgn(data,db(i),'measured');
    %write 6 audio files with correct filname 1-6
    audio_order = 'noisedsignal_%d.wav';
    A = i;
    audio_name = sprintf(audio_order,A);
    audiowrite(audio_name,noise(i,:),fs);
end

for i = 1:6
    %read 6 audio files with correct filname 1-6
    audio_order = 'noisedsignal_%d.wav';
    A = i;
    audio_name = sprintf(audio_order,A);
    %use the PESQ to compare the original signal and the
noised signal
    score(i,1) = pesq('C_01_01.wav',audio_name);
end
```




It can be seen that when SNR is less than 5dB, the score is almost the same. But when SNR keeps gets higher, we can have a much better score.

## 1.3 Masking release

Code:

```
clear;clc
signal = audioread('C_01_01.wav')';
noise_3 = awgn(signal,-3,'measured');
compete = audioread('C_01_02.wav');
compete = [compete'  zeros(1,length(signal)-
length(compete))];
compete_3 = compete*1.873;% reamplitude to make snr=-3db
sound(noise_3, 16000);
sound(signal+compete_3, 16000);

noise_6 = awgn(signal,-6,'measured');
compete_6 = compete*2.645;% reamplitude to make snr=-6db
sound(noise_6, 16000);
sound(signal+compete_6, 16000);
```

It sounds that with the same SNR, when the noise signal is a competing voice, it has better quality, but lower intelligibility of the signal.

When SNR decreased to -6dB, the AWGN noise sounds much louder than the competing voice.