DSP Projects of Chapter 5

Shift the pitch of a soundtrack of a person singing (downloaded from the course Web site) and process the data to make them sing 6 semitones lower or higher. A semitone corresponds to multiplying a number of Hz by 21/12, which is about 1.06.

Source code:

clear all; close all; clc;

% 1. 讀取音頻文件

[y, fs] = audioread('singing16k16bit-clean.wav');

% 2. 指定要進行的音高變化

semitones = 6; % 提高 6 个半音

% 3. 使用 shiftpitch 函數進行處理

y\_pitchshifted1 = shiftPitch(y, semitones);

%sound(y\_pitchshifted1, fs);

% 5. 保存音頻

audiowrite('output\_audio1.wav', y\_pitchshifted1, fs);

[y, fs] = audioread('singing16k16bit-clean.wav');

semitones = -6; % 降低6個半音

% 3. 使用 shiftpitch 函數進行音高調整

y\_pitchshifted2 = shiftPitch(y, semitones);

%sound(y\_pitchshifted2, fs);

% 5. 保存調整後的音頻

audiowrite('output\_audio2.wav', y\_pitchshifted2, fs);

% 生成聲譜圖

figure;

subplot(3, 1, 1);

spectrogram(y, hamming(256), 128, 512, fs, 'yaxis'); % 原始文件的圖

title('Original Audio');

subplot(3, 1, 2);

spectrogram(y\_pitchshifted1, hamming(256),128 , 512, fs, 'yaxis'); % 音高降低的圖

title('Pitch Shifted -6 semitones');

subplot(3, 1, 3);

spectrogram(y\_pitchshifted2, hamming(256), 128, 512, fs, 'yaxis'); % 音高升高的圖

title('Pitch Shifted +6 semitones');

一張含有 文字, 螢幕擷取畫面, 鮮豔, Rectangle 的圖片

自動產生的描述