

Task 1 – Resources

Following is the link to one of the most recommended course for Audio signal processing methodologies:

- URL: [audio-signal-processing](#)

We suggest you to go through the following video links that will be useful for task completion (To those interested may go through entire course).

1. Introduction to sms-tools:

Video explains the tools that have been created for audio processing.

- URL: [introduction-to-sms-tools](#)
- URL: [sms-tools-software](#)

2. DFT:

Video explains the most fundamental topic; the Discrete Fourier Transform (DFT) along with Discrete Fourier transform equation, what are the complex exponentials and the scalar product. Second video covers DFT of complex sinusoids, real sinusoids and Inverse-DFT.

- URL: [dft-1](#)
- URL: [dft-2](#)

3. STFT:

Video explains Short-Time Fourier Transform, different types of windows and the concept of even and odd sized window.

- URL: [stft-1](#)
- URL: [stft-2](#)

4. Peak Detection:

Video explains equations to measure the frequency, the amplitude, and phase of a sinusoid using parabolic interpolation. It also explains how to detect spectral peak locations and interpolate peak values using parabolic interpolation.

- URL: [peak-detection](#)

5. Auto-correlation:

Video explains the basics of autocorrelation used for F0 (fundamental frequency) detection in time domain.

- URL: [f0-detection](#)

6. Two-Way Mismatch Algorithm:

Video explains the use TWM algorithm for F0 (fundamental frequency) detection problem in the frequencies of main. It can be formulated as a pattern matching problem in which we have to find the pattern of the harmonic series that best fits the spectrum.

- URL: [f0-detection](#)

