SYDE 252 Matlab® Assignment 3

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Question 1

All we needed to do here was apply our FT function from assignment 2 to the original and synthesized signals to view their frequency spectrum. This required us to build a time domain for the two signals based on the sampling rate. Given the sampling rate in Hz, we know the time elapsed between two data points would be the reciprocal of the sampling rate. We used this as our time increment for the two time domains, building each to an equal length as its corresponding time signal.

The results are as pictured:

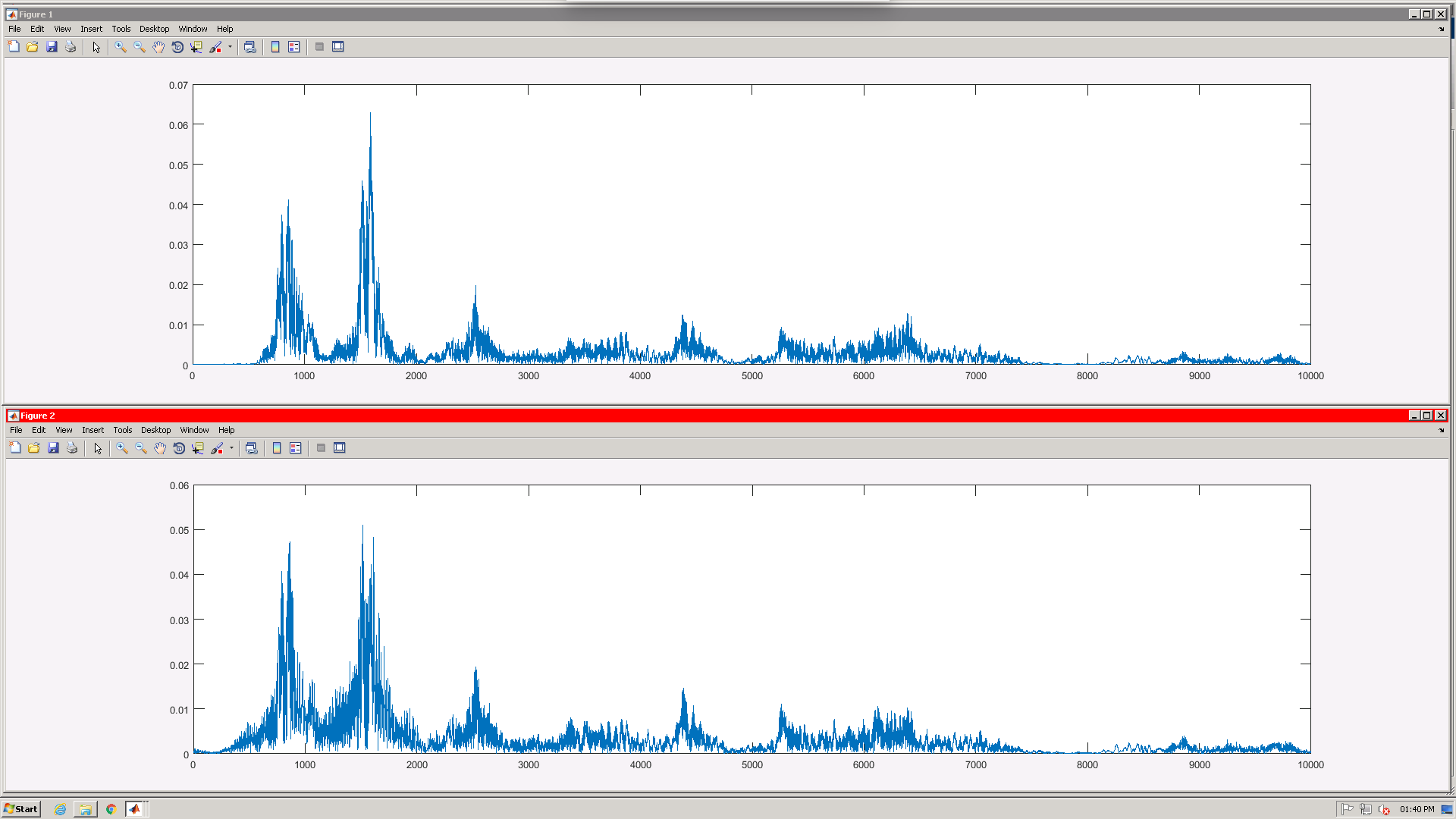


Figure - Frequency spectrum of original signal (top) and synthesized signal (bottom)

Firstly, it is evident that these signals are very similar – as they should be, given that the second signal is the deconvoluted and re-synthesized version of the first. Both signals have large peaks around 900 and 1500 Hz, composing the primary frequency content of the voice signal. There are smaller peaks from 2500 – 7000 Hz, after which the spectrum dies out.

The primary noticeable difference in the spectrums is the quality of the synthesized signal. Specifically, there is more noise in the synthesized signal, especially visible between the peaks at 900 and 1500 Hz. This is likely due to some loss of information caused by the deconvolution