Introduction

The Fast Fourier Transform is not a new type of Fourier transform but indicates a fast algorithmic technique to numerically compute the DFT of a finite data set. In general, the straightforward DFT computation of a signal of length N requires on the order of N^2 arithmetic operations whereas a good FFT algorithm requires only $N \log N$ operations. The availability of fast DFT algorithms was the fundamental game-changer in the history of digital signal processing, allowing for more and more complex applications on inexpensive hardware.

In this optional lesson, we will look at the historical development of fast DFT algorithms and explore in detail a particular type of FFT called "decimation in frequency".