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Digital Signal Processing

FFT’s Impact on the Nuclear Arms Race

During the early part of the Cold War, nuclear powers took to testing their nuclear devices in remote parts of the world like the Artic, South Pacific, and in deserts like in Nevada. However, in 1963, the Partial Nuclear Test Ban Treaty was signed that prohibited testing nuclear devices in Space, in the atmosphere, and underwater. The treaty left out underground testing because, at the time, it was impossible to verify an underground nuclear test. In order to distinguish seismic events from underground nuclear tests, American physicists and mathematicians used the Fourier Transform on seismometer data. The issue was that Fourier Transforms require far too many calculations to be calculated quickly on 1960s computers. In 1963, the Fast Fourier Transform (FFT) was developed in order to combat this issue. Unfortunately, it was discovered too late to have a real impact on the Nuclear Arms Race before it was sent underground, if it was discovered earlier, it could have ended all nuclear testing in 1963. Today, the FFT is used in a wide variety of applications, one given in the video is on compression algorithms for pictures, which allow photos to be stored far easier on modern computers. Because of its wide use today, the FFT is said to be the most influential mathematical algorithm developed of our lifetime.