MUS 7: Fourier Transform

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Frequency Domain

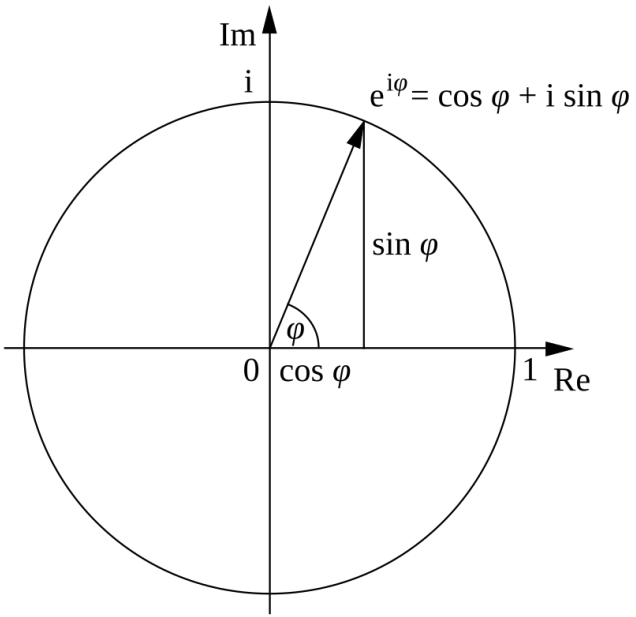
Fourier Transform

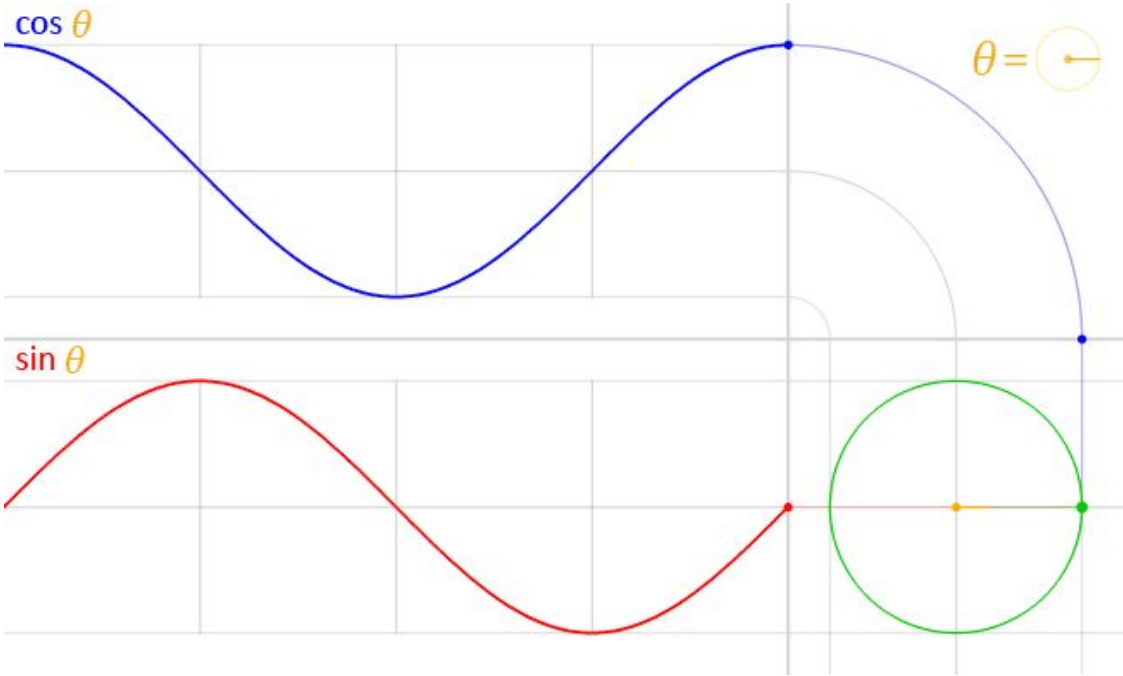
Continuous Time Fourier Transform $$X(f) = \int_{-\infty}^{\infty} x(t) e^{-i2\pi ft}$$

Discrete Time Fourier Transform (DTFT) $$X_{1/T}(f) = \sum_{n=-\infty}^{\infty} x[n] e^{-i2\pi fTn}$$

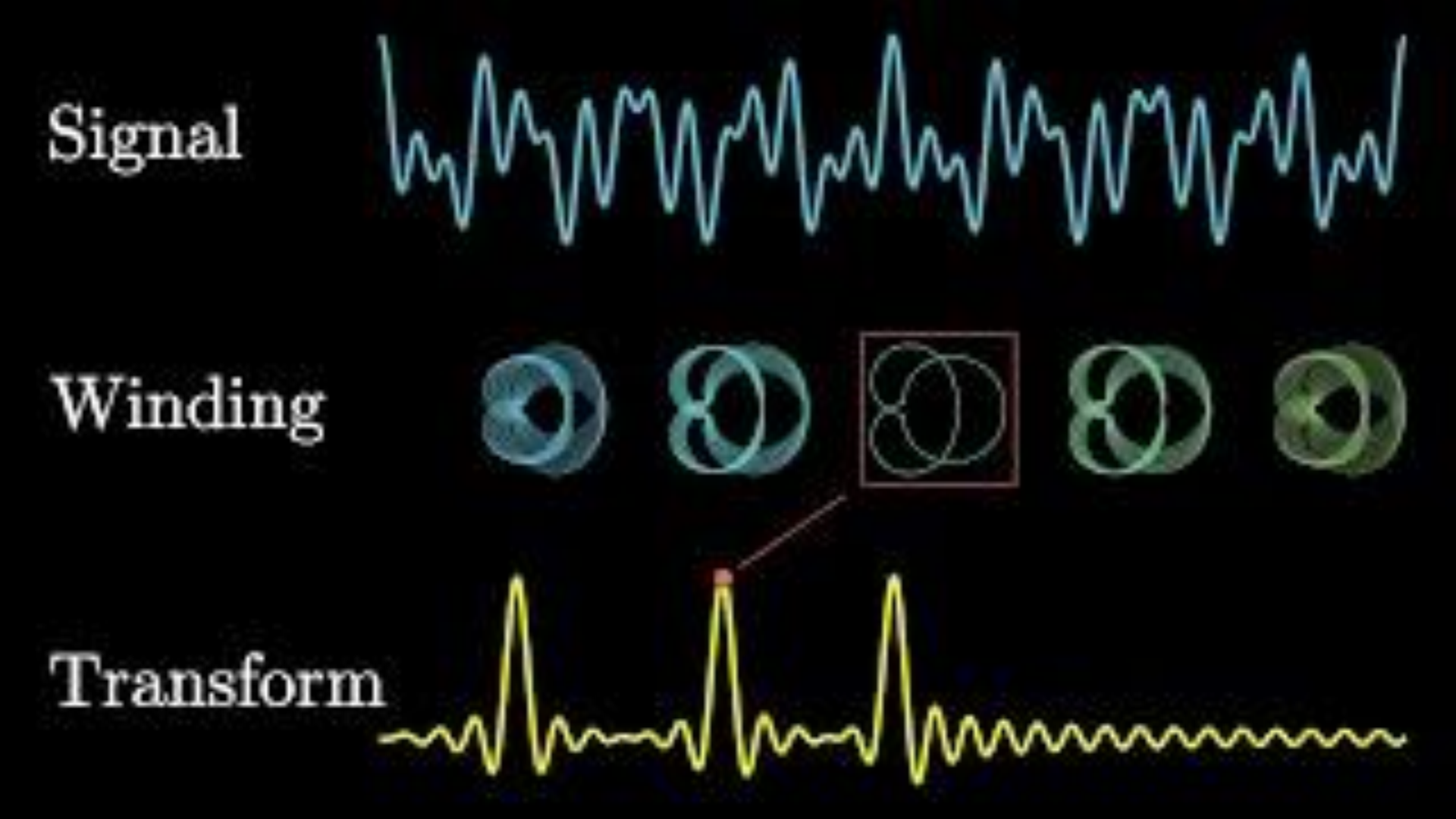
Discrete Fourier Transform (DFT) $$X[k] = \sum_{n=0}^{N-1} x[n] e^{-i2\pi \frac{k}{N} n}$$

Euler's Formula $e^{ix} = \cos x + i \sin x$





$$e^{i\pi} \equiv -1$$


Signal
Winding
Transform