different transforms used in signal processing

Nasser M. Abbasi

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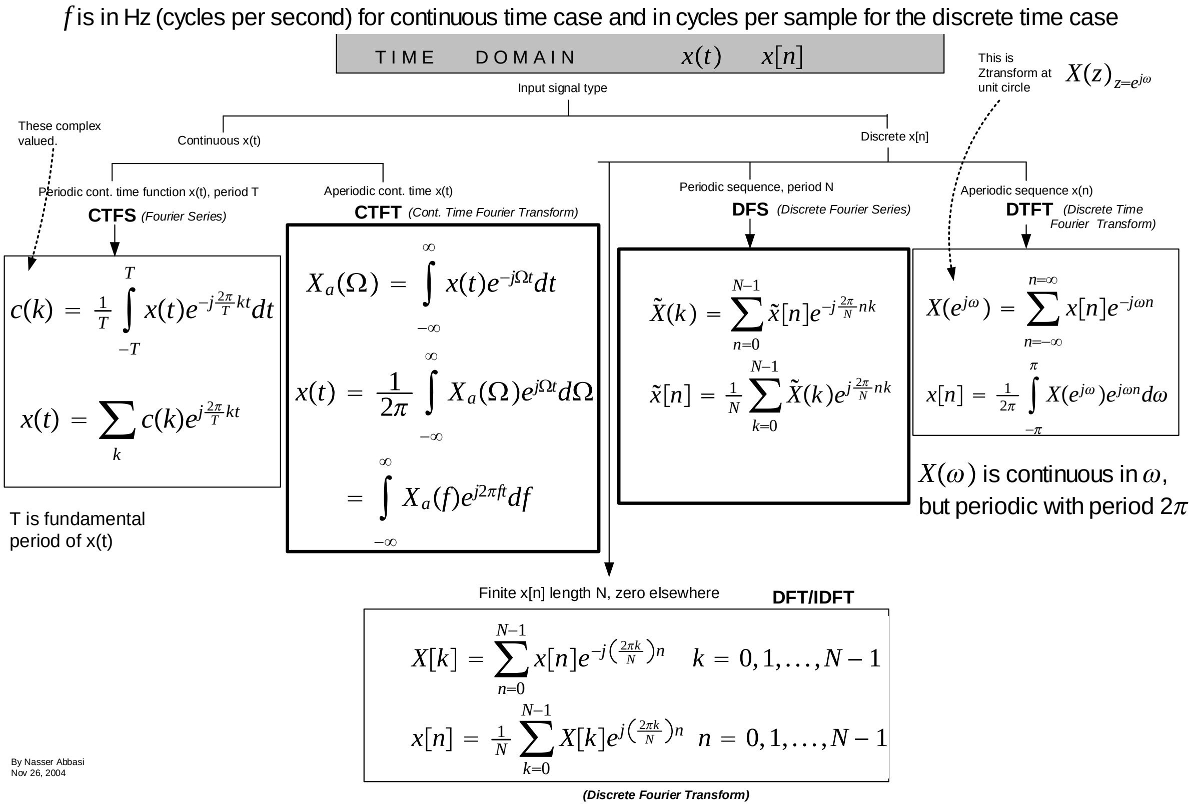
Note: Ω measured is in rad/sec is the radian frequency used for the continuous time case.
ω measured is in radians only (not radians/sec) and is the radian frequency used for the discrete time case.
f is in Hz (cycles per second) for continuous time case and in cycles per sample for the discrete time case



The book `signals and systems by Oppenheim, Willsky, Young`, also has a nice diagram, here is pic of it (click to enlarge)

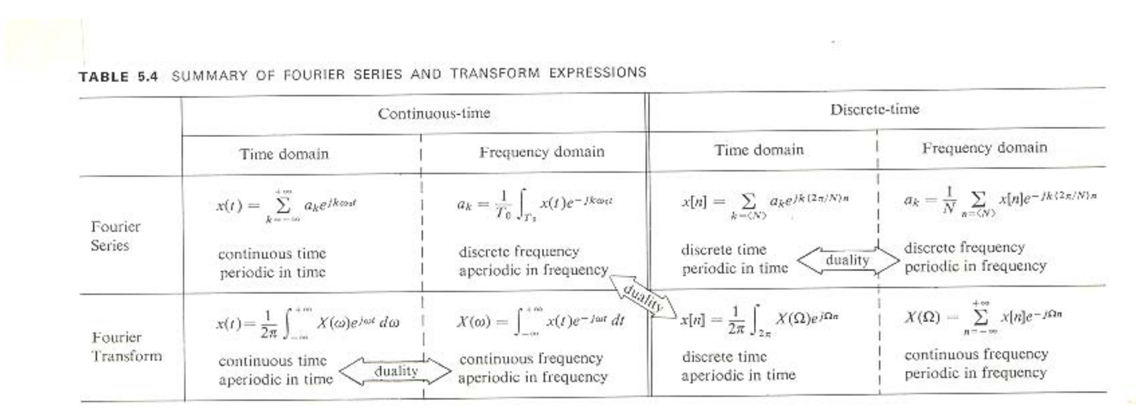


TABLE 5.4 SUMMARY OF FOURIER SERIES AND TRANSFORM EXPRESSIONS

	Continuous-time		Discrete-time	
	Time domain	Frequency domain	Time domain	Frequency domain
Fourier Series	$x(t) = \sum_{k=-\infty}^{+\infty} a_k e^{jk\omega_0 t}$ continuous time periodic in time	$a_k = \frac{1}{T_0}\int_{T_0} x(t)e^{-jk\omega_0 t}$ discrete frequency aperiodic in frequency	$x[n] = \sum_{k=\langle N\rangle} a_k e^{jk(2\pi/N)n}$ discrete time periodic in time (duality)	$a_k = \frac{1}{N}\sum_{n=\langle N\rangle} x[n]e^{-jk(2\pi/N)n}$ discrete frequency periodic in frequency
Fourier Transform	$x(t) = \frac{1}{2\pi}\int_{-\infty}^{+\infty} X(\omega)e^{j\omega t}d\omega$ continuous time aperiodic in time (duality)	$X(\omega) = \int_{-\infty}^{+\infty} x(t)e^{-j\omega t}dt$ continuous frequency aperiodic in frequency	$x[n] = \frac{1}{2\pi}\int_{2\pi} X(\Omega)e^{j\Omega n}$ discrete time aperiodic in time	$X(\Omega) = \sum_{n=-\infty}^{+\infty} x[n]e^{-j\Omega n}$ continuous frequency periodic in frequency

duality