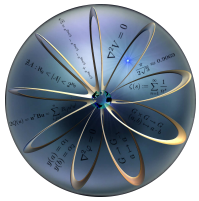

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time invariant

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Defines	shift-invariant

A dynamical system is **time-invariant** if its generating formula is dependent on state only, and independent of time. A synonym for time-invariant is autonomous. The complement of time-invariant is time-varying (or nonautonomous).

For example, the continuous-time system $\dot{x} = f(x, t)$ is time-invariant if and only if $f(x, t_1) \equiv f(x, t_2)$ for all valid states x and times t_1 and t_2. Thus $\dot{x} = \sin x$ is time-invariant, while $\dot{x} = \frac{\sin x}{1+t}$ is time-varying.

Likewise, the discrete-time system $x[n] = f[x, n]$ is time-invariant (also called shift-invariant) if and only if $f[x, n_1] \equiv f[x, n_2]$ for all valid states x and time indices n_1 and n_2. Thus $x[n] = 2x[n-1]$ is time-invariant, while $x[n] = 2nx[n-1]$ is time-varying.