

What does it mean if the lti system has initial energy storage

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The zero-input response, which is what the system does with no input at all. This is due to initial conditions, such as energy stored in capacitors and inductors. The zero-state response, which is the ...

To define stabilizability and detectability of an LTI system, we first introduce the concept of system mode, which can be naturally derived from the fifth definition of controllability C.5 (observability C.7).

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If a discrete-time LTI system has an impulse response $h[n]$ that is not identically zero for $n \neq 0$, then the system has memory. An example of an LTI system with memory is the system given by eq. (2.42).

Since most periodic (non-periodic) signals can be decomposed into a summation (integration) of sinusoids via Fourier Series (Transform), the response of a LTI system to virtually any input is ...

Time-invariant systems are modeled with constant coefficient equations. A constant coefficient differential (or difference) equation means that the parameters of the system are not changing over ...

Summary Overview Continuous-time systems Discrete-time systems Further reading External links The defining properties of any LTI system are linearity and time invariance. o Linearity means that the relationship between the input and the output, both being regarded as functions, is a linear mapping: If $x_1[n]$ is a constant then the system output to it is $y_1[n]$; if $x_2[n]$ is a further input with system output $y_2[n]$ then the output of the system to $x_1[n] + x_2[n]$ is $y_1[n] + y_2[n]$, this applying for all choices of x_1, x_2, y_1, y_2 . The latter condition is often referred to as the superposition principle

Any system that can be modeled as a linear differential equation with constant coefficients is an LTI system. Examples of such systems are electrical circuits made up of resistors, inductors, and ...

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Set of variables of smallest possible size that together with any input to the system is sufficient to determine the future behavior (I.e., output) of the system.

An LTI system is "initially relaxed" or "at rest" if all its initial conditions are zero before an input is applied. This means there is no stored energy in the system.

Classical Solution: Solve for $()$, > 0 and use the initial conditions (I.C.) $(0+)$, $(0+)$, In the classic method, we avoid the $()$ in the input by analyzing the system for strictly positive (thus avoiding the ...

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