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In mathematics and science, a nonlinear system is a system in which the change of the output is not proportional to the change of the input. Nonlinear problems are of interest to engineers, biologists, physicists, mathematicians, and many other scientists because most systems are inherently nonlinear in nature.

~~Nonlinear system - Wikipedia~~

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~~14 Stability of nonlinear systems - Trinity College Dublin~~

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~~Nonlinear Systems: Analysis, Stability and Control Outline~~

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Contraction analysis is a stability theory for nonlinear systems where stability is defined incrementally between two arbitrary trajectories (Lohmiller and Slotine, 1998). The existence of a contraction metric for a nonlinear system ensures that a suitably defined distance between nearby trajectories is always decreasing.

~~Stability and Robustness Analysis of Nonlinear Systems ...~~

For systems with inputs, one must quantify the effect of inputs on the stability of the system. The main two approaches to this analysis are BIBO stability (for linear systems) and input-to-state stability (ISS) (for nonlinear systems)

~~Lyapunov stability — Wikipedia~~

Linear and Nonlinear Instabilities in Mechanical Systems: Analysis, Control and Application Hiroshi Yabuno, University of Tsukuba, Japan
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