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Long Term Love Relationships Analyzed as a Dynamic System with Random Variations

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Abstract : In this work, we model a coupled system where we explore the effects of steady and random behavior on a linear system like an extension of the classic Strogatz model. This is exemplified by modeling a couple love dynamics as a linear system of two coupled differential equations and studying its stability for four types of lovers chosen as CC='Cautious-Cautious', OO='Only other feelings', OP='Opposites' and RR='Romeo the Robot'. We explore the effects of, first, introducing saturation, and second, adding a random variation to one of the CC-type lover, which will shape his character by trying to model how its variability influences the dynamics between love and hate in couple in a long run relationship. This work could also be useful to model other kind of systems where interactions can be modeled as linear systems with external or internal random influence. We found the final results are not easy to predict and a strong dependence on initial conditions appear, which a signature of chaos.

Keywords : differential equations, dynamical systems, linear system, love dynamics
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