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Chaotic phenomena and fractional-order dynamics in the trajectory control of redundant manipulators. (English) [Zbl 1027.70011](#)

[Nonlinear Dyn.](#) 29, No. 1-4, 315-342 (2002).

Summary: Redundant manipulators have some advantages when compared with classical arms because they allow the trajectory optimization, both in the free space and in the presence of obstacles, and allow the resolution of singularities. For this type of arms the proposed kinematic control algorithms adopt generalized inverse matrices but, in general, the corresponding trajectory planning schemes show important limitations. Motivated by these problems, this paper studies the chaos revealed by pseudoinverse-based trajectory planning algorithms, using the theory of fractional calculus.

MSC:

[70E60](#) Robot dynamics and control of rigid bodies

[70Q05](#) Control of mechanical systems

[70K55](#) Transition to stochasticity (chaotic behavior) for nonlinear problems in mechanics

[26A33](#) Fractional derivatives and integrals

Cited in **25** Documents

Keywords:

[planar manipulators](#); [redundant manipulators](#); [kinematic control](#); [chaos](#); [pseudoinverse-based trajectory planning](#); [fractional calculus](#)

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