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On the stability of globally projected dynamical systems. (English) Zbl 0971.37013

J. Optimization Theory Appl. 106, No. 1, 129-150 (2000).

The problem of stability of dynamical systems is very hard. Even to practically solve this problem for equilibrium points is not possible in general. So new techniques to attack this problem have been proposed. One of them [*P. Dupuis* and *A. Nagurney* [Ann. Oper. Res. 44, 9-42 (1993; Zbl 0785.93044)] constructs a globally projected dynamical system. One can show there is then a close connection of this problem to the variational inequality method. Even more the authors show that there is a relationship to the associated dynamical system with the optimal solution of a mathematical quadratic programming problem. By the above mentioned approach the authors are able to give weaker sufficient conditions for the stability which are less restrictive than those of the paper cited above. The global asymptotic stability conditions given in the paper are the symmetry and monotonicity of the treated functions. Another novelty of the paper is the result on global exponential stability. The projected dynamical systems have important applications in economics, physical equilibrium analysis, and mathematical programming.

Reviewer: Ladislav Andrey (Praha)

MSC:

37C75 Stability theory for smooth dynamical systems
37N40 Dynamical systems in optimization and economics

Cited in **1** Review
Cited in **45** Documents

Keywords:

globally projected dynamical systems; stability analysis; variational inequality; neural networks

Full Text: DOI

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