

INTERNATIONAL JOURNAL OF BIOMATHEMATICS

Vol. 6, No. 6 (November 2013)

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International Journal of Biomathematics
Vol. 6, No. 6 (2013) 1350037 (13 pages)
© World Scientific Publishing
DOI: 10.1142/S179352451350037

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In this paper, a nonlinear system with stage structure is considered. The stability of the linear difference-algebraic system is analyzed. A generalized proportional-integral controller is designed to stabilize the system. A Lyapunov function is used to make the unmodeled dynamics stable. The results of the proposed control method are presented.

Keywords: Difference-algebraic system, ANFIS.

Mathematics Subject Classification

1. Introduction

Many real-world systems can be modeled by differential-algebraic equations (DAEs). DAEs provide an essential tool for the analysis of applied sciences and engineering problems about shortage of resources. In the rapidly growing interest in the study of human need, the exploitation of natural resources, the