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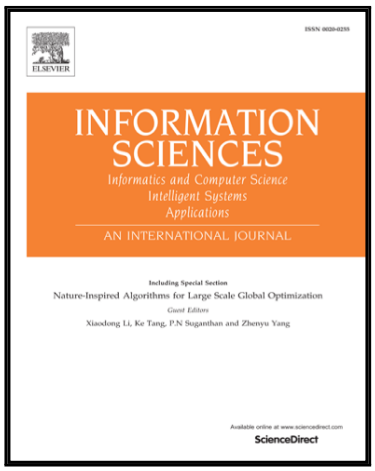

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ACCEPTED MANUSCRIPT

Fuzzy Numbers Intuitionistic Fuzzy Descriptor Systems

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Abstract: By using interval type-2 fuzzy systems and fuzzy numbers intuitionistic fuzzy sets, fuzzy numbers intuitionistic fuzzy descriptor systems are proposed in this paper. Their definition is given firstly, and the stability of this kind of systems is studied, the relations of interval type-2 fuzzy systems and T-S fuzzy descriptor systems and fuzzy numbers intuitionistic fuzzy descriptor systems are discussed. Fuzzy numbers intuitionistic fuzzy controller and the stability of fuzzy numbers intuitionistic fuzzy descriptor systems are deeply researched. Fuzzy numbers intuitionistic fuzzy descriptor systems can be better used to solve the problems of actual nonlinear control. Fuzzy numbers intuitionistic fuzzy descriptor systems will be a new research direction, and will become a universal method to solve practical problems. Finally, an example is given to illustrate effectiveness of the proposed method.

Keywords: interval type-2 fuzzy systems; T-S fuzzy descriptor systems; fuzzy numbers intuitionistic fuzzy sets; Stability; distance.

0 Introduction

Fuzzy control[1-3] has made great progress on intelligent computing research and practice applications now. The rapid development of fuzzy control is inseparable from the support of fuzzy set theory. Fuzzy set[4-6] theories provide not only new scientific logic and methods for information science and cognitive science, but also an effective method for intelligent information processing technology. But the research on intuitionistic fuzzy control[7] is still just beginning and the research is not deeply and widely, intuitionistic fuzzy sets[8] have always many new theories and is more relevant to objective facts and human thinking, so we very want to study some new intuitionistic fuzzy control in order to solve practical control problems more easily and feasible.

In 1989, K. Atanassov firstly introduced the definition and different operators of interval-valued intuitionistic fuzzy sets[9-10].Then the basic theories on interval-valued intuitionistic fuzzy sets have been studied deeply and widely applied in many fields since 1994 , and got good results. In 2005, we found that interval-valued intuitionistic fuzzy sets turn the membership function of intuitionistic fuzzy sets into the interval ambiguity function, so we think if interval-valued intuitionistic fuzzy sets can keep consistent with intuitionistic fuzzy sets in form, and intuitionistic fuzzy sets can also be further blurred, hence the fuzzy numbers intuitionistic fuzzy sets[11] are firstly proposed. The operations of fuzzy number intuitionistic fuzzy sets[12] and fuzzy number intuitionistic fuzzy group have all been given. Finally, in the sense of homomorphism and isomor-

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