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Fuzzy logic-based adaptive gravitational search algorithm for optimal tuning of fuzzy-controlled servo systems

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[View ResearcherID and ORCID](#)**IET CONTROL THEORY AND APPLICATIONS****Volume:** 7 **Issue:** 1 **Pages:** 99-107**DOI:** 10.1049/iet-cta.2012.0343**Published:** JAN 2013[View Journal Impact](#)

Abstract

This study proposes an adaptive gravitational search algorithm with a new depreciation law of the gravitational constant and of the force exerted from the other agents to the iteration index. The algorithm consists of two output (SITO) fuzzy block in the algorithm's structure. In the first domain, the iteration index is the input variable and the iteration index weighted sum of all forces are the output variables. The algorithm is derived from Popov's hyperstability analysis results. The algorithm is a method for Takagi-Sugeno proportional-integral fuzzy control of servo systems modelled by second-order models with an input delay. It solves a minimisation-type optimisation problem based on the iteration index.

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sensitivity function with respect to process gain varia
offered. AGSA is validated by a case study that optin
laboratory servo system. Representative experiment

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