Evolutionary optimization-based tuning of low-cost fuzzy controllers for servo systems

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Abstract

This paper suggests the optimal tuning of low-cost fu
systems by means of three new evolutionary optimiz
(GSA), Particle Swarm Optimization (PSO) algorithm
processes in these servo systems are characterized
and variable parameters; therefore the objective func
output sensitivity functions of the sensitivity models c
the processes. The servo systems are controlled by
controllers (T-S PI-FCs) that consist of two inputs, tri
the rule base, the SUM and PROD operators in the i

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in the defuzzification module. The T-S PI-FCs are im
their simple structure and of the only three tuning pa
linear proportional-integral (PI) controllers onto the p
equivalence principle and of the Extended Symmetri
are solved by GSA, PSO and SA resulting in fuzzy c
comparison of the three evolutionary algorithms is ca
on the optimal tuning of T-S PI-FCs meant for the po
equipment. Reduced process gain sensitivity is ensu

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