

Article Abstract

Title:	Improved particle swarm optimization approach for nonconvex static and dynamic economic power dispatch
Author(s):	Rajkumari Batham ¹ , Kalpana Jain ² and Manjaree Pandit ^{3*}
Address(es):	* Department of Electrical Engineering, Madhav Institute of Technology and Science Gwalior, INDIA *Corresponding Author: manjaree_p@hotmail.com, Tel +91- 0751-2665962, +91-0751-2409380
Journal:	<i>International Journal of Engineering, Science and Technology</i> , Vol. 3, No. 4, 2011, pp. 130-146.
Abstract:	The cost of power generation in fossil fuel plants is very high and economic dispatch helps in saving a significant amount of revenue. For practical generators the economic dispatch problem gets translated into a complex non-convex, multimodal optimization problem which can not be solved by traditional gradient based optimization methods. The complexity further increases due to the multiple constraints that need to be satisfied. This paper proposes an improved particle swarm optimization approach (IPSO) for solving nonconvex static and dynamic economic dispatch. The classical PSO (CPSO) approach suffers from the problem of premature convergence, particularly for complex multimodal functions. The idea behind IPSO is i) to enhance the search capability of the CPSO by reinitializing the velocity vector whenever saturation sets in and ii) to use a parameter automation strategy to strike a proper balance between local and global search. The performance of IPSO has been tested on five standard test cases. The results are compared with previously published literature and are found to be comparable/or superior.
Keywords:	Improved PSO, premature convergence, static/dynamic economic dispatch, prohibited operating zones, ramp rate limits, and valve point loading effects.