Title of the Project :Evolutionary Optimization of Computationally intensive problems with surrogate models

Project Approval Letter Reference: UGC Ref. F. No. 38-248/2009 (SR), Dated 24th December 2009

Name of the Principal Investigator: Dr. S.BASKAR, Professor , Dept. of EEE

Project Amount: Rs. 10.26 Lakhs; **Period**: 2010-2012

ABSTRACT

Evolutionary Algorithms (EAs) take very high computing time when it is applied to computationally expensive real-world optimization problems. In order to alleviate this problem, an inexpensive Surrogate model is integrated with Self Adaptive Differential Evolution (SaDE). Various soft computing models such as response surface method, neural networks, Fuzzy Logic system, Support vector machine and extreme learning machines are considered as possible surrogate models for this research work. A new integration methodology is devised for combining SaDE and actual/model based function evaluations. Diversity controlled parameter adaptation methodology is applied to vary the crossover rate scaling factor of SaDE algorithm. The diversity of the population is maintained at a desired level by varying the control parameters using FIS. The performance of the proposed algorithm is demonstrated on the standard benchmark optimization problems.

- Man Power trained :Project Fellow – 01
- Equipment Purchased : High Performance computing system
- Ph.D. Awarded : 01
- M.E. Thesis completed : 01
- Publications : 03

SMJ Amali, S Baskar, Fuzzy logic-based diversity-controlled self-adaptive differential evolution Engineering Optimization 45 (8), 899-915
SMJ Amali, S Baskar ,Surrogate assisted-hybrid differential evolution algorithm using diversity control, Expert Systems: The Journal of Knowledge Engineering 32 (4), 531-545
SMJ Amali, S Baskar, Parameter Adaptation in Differential Evolution Based on Diversity Control, International Conference on Swarm, Evolutionary, and Memetic Computing, 146-157