



Marmara University
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Department of Statistics



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“Hybrid Evolutionary Algorithm for Global Optimization Problems”

Many optimization problems in practical applications are subject to several constraints. The constraints can make an easy problem into hard and hard problems into even more harder ones. In the last few years, it is a big challenge for researchers to design robust algorithms that can perform on all types of optimization problems with an efficient manner and ability. Particle Swarm Optimization (PSO) is one of the most popular optimization methods among other population based stochastic algorithms. It has ability of solving both constrained and unconstrained optimization problems. PSO was developed inspired by the searching behaviour of swarm such as bird flocks or fish schools. This swarm intelligence based algorithm is most likely following the main principles of Genetic Algorithms (GA). It works with the set of solutions called particles by employing the velocity and position vector to generate new set of particles for the next generation of evolution. During their search process, PSO can utilize the local best solution denoted by P_b and global best position denoted G_b to perform their search process. In this talk, I will discuss our recently developed hybrid version of PSO for dealing with test suite of constrained optimization problems. The suggested hybrid PSO has two versions namely CPSO-Static and CPSO-Adaptive. The suggested algorithms use two penalty functions techniques with static and self-adaptive procedures. The performance of the suggested algorithms are analysed with 24 constrained benchmark functions designed for 2006 IEEE Conference of Evolutionary Computation (IEEE-CEC'06). Both CPSO-Static and CPSO-Adaptive have shown better perform compared to the state-of-the-art version of the differential evolution (DE) dealing with most of the CEC'06 benchmark functions.

**Department of
Mathematics**

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Research Areas

Artificial Intelligence
Applied Mathematics
Solid Transportation Problem
Solid Assignment Problem

Venue

Marmara University,
Göztepe Campus,
Institute Building
Conference Hall

September 29, 2017

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