Abstract

By virtue of Optimization one can minimize or maximize a particular function in a finite dimensional Euclidean space over a subset of that space, which is generally determined by functional inequalities. It is the result of continuous research that Optimization has been evolve into an established field and had expanded in many branches like linear conic optimization, convex optimization, global optimization, discrete optimization, etc. Each of such branches has a sound theoretical foundation and is featured by an extensive collection of sophisticated algorithms and software. Optimization, as a powerful modeling and problem solving methodology, has a broad range of applications in management science, industry and engineering.

The main concern of optimized design is the finding of optimum parameters according to a given optimality standard. To cope up with the current development in engineering and other fields we must have to update over optimization techniques which can be use for the non-differentiable, not continuous objective functions. Every optimization techniques have its
own merits and demerits and may be good for any particular purpose and may be worst for some other purpose. Like application of global optimization algorithm is sometimes a very time consuming task. The best local optimization methods for this purpose are the gradient methods. So in this work an intelligent way of using these optimization techniques is being presented which illustrate the fact that which techniques or a combination of techniques may be efficiently used for a given purpose. For that we have demonstrated the use of global optimization in two different tasks one is optimization of step size of LMS algorithm using Ant Colony Optimization (ACO) & Particle swarm optimization (PSO) and the other is designing of an Analog Sallen Key Band Pass filter using ACO.

Simulation of each case using MATLAB is done to prove the validity of optimized result and optimized designing.

References

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Index Terms

Computer Science Software Engineering

Keywords

Optimization, Global Optimization Techniques, Ant Colony Optimization, Particle Swan Optimization, Sallen key band pass filter.