



[Home](#)

[Aims and Scope](#)

[Submit a Paper](#)

[Author Guidelines](#)

[Editorial Board](#)

[Review Process](#)

[Search All](#)

[Become a Member](#)

[Indexing Service](#)

[Publication Charge](#)

[Recommend to Peers](#)

[Recommend to Library](#)

[Best Paper Awards](#)

[Terms & Conditions](#)

[Special Issues](#)

**International Journal of Intelligent Systems and Applications(IJISA)**  
ISSN: 2074-904X (Print), ISSN: 2074-9058 (Online)

**Publisher: MECS**

**IJISA Vol.4, No.2, March 2012**

## **Imperialist Competitive Algorithm with Adaptive C**

[Full Text](#) (PDF, 368KB), PP.49-57

### **Author(s)**

Helena Bahrami, Marjan Abdechiri, Mohammad Reza Meybodi

### **Index Terms**

Imperialist Competitive Algorithm; Absorption Policy; Density Probabilistic Model

### **Abstract**

The novel Imperialist Competitive Algorithm (ICA) that was recently introduced for solving some optimization problems. The ICA inspired by socio-political process of imperialism in the real world. In this paper, a new Imperialist Competitive Algorithm (ICAR) is proposed. In the proposed algorithm, for an exploration policy changed dynamically to adapt the radius of colonies movement toward the global optimum is easily stuck into a local optimum when solves high-dimensional multi-modal problems. To overcome this shortcoming, we use probabilistic model that utilizes random positions to balance the exploration and exploitation abilities of the Imperialist Competitive Algorithm. This mechanism, ICA exploration capability will enhance. Some famous unconstrained test functions to test the ICAR performance. Simulation results show this strategy can improve the algorithm significantly.

### **Reference**

- [1] H. Sarimveis and A. Nikolakopoulos, "A Line Up Evolutionary Algorithm for Solving Optimization Problems," *Computers & Operations Research*, 32(6):pp.1499–1515, 2005.
- [2] M. Melanie, "An Introduction to Genetic Algorithms," *Massachusetts's MIT Press*, 1995.
- [3] J. Kennedy and R.C. Eberhart, "Particle swarm optimization," in: *Proc. Conference on Neural Networks*, Piscataway: IEEE, pp. 1942–1948, 1995.
- [4] L. A. Ingber, "Simulated annealing: practice versus theory," *J. Math. Comput.*, 1993.
- [5] B. Franklin and M. Bergerman, "Cultural Algorithms: Concepts and Experimental Results," *IEEE Congress on Evolutionary Computation*, 2: pp. 1245–1251, 2000.
- [6] M. Dorigo, V. Maniezzo and A. Coloni, "The ant system: optimization by a colony of cooperating ants," *IEEE Transaction System Man Cybern*, B 26(1):pp. 29–41, 1996.
- [7] R. Storn and K. Price, "Differential evolution - a simple and efficient heuristic for global optimization over continuous spaces," *Journal of Global Optimization*, 11(4):pp. 341–359, 1997.
- [8] K. Lee and Z. Geem, "A new structural optimization method based on the harmony search algorithm," *Computers and Structures*, 82:781-98, 2004.

- Copyright © 2007-2011 MECS.  
All Rights Reserved.  
Microsoft Internet Explorer is  
recommended if the page is not  
displayed properly!
- [9]F. J. Von Zuben and L. N. De Castro, "Artificial Immune Systems: Part I - School of Computing and Electrical Engineering, State University of Campinas RT 01/99, 1999.
- [10]A. Kaveh, S. Talatahari "A novel heuristic optimization method: Charged s doi:10.1007/s00707-009-0270-4.
- [11]E. Rashedi, H. Nezamabadi-pour and S. Saryazdi, "A Gravitational Search Algorithm," Information Science, Special Section on High Order Fuzzy Sets, 179(13): pp. 2232-2248, 2009.
- [12]E. Atashpaz-Gargari and C. Lucas, "Imperialist Competitive Algorithm: Inspired by Imperialistic Competition," IEEE Congress on Evolutionary Com 4667, 2007.
- [13]H. Bahrami, K. Faez, M. Abdechiri, "Imperialist Competitive Algori Optimization," UKSim-AMSS 12th International Conference on Computer Model
- [14]R. Rajabioun, F. Hashemzadeh, E. Atashpaz-Gargari, B. Mesgari and F. Ra MIMO Evaporator and Its Decentralized PID Controller Tuning Using C Accepted to be presented in IFAC World Congress, 2008.
- [15]A. Biabangard-Oskouyi, E. Atashpaz-Gargari, N. Soltani and C. Luc Competitive Algorithm for materials property characterization from sharp Journal of Engineering Simulation, under revision, 1(3):pp. 337-355, 2008.
- [16]M. Abdechiri, K. Faez and H. Bahrami, "Neural Network Learning based on Algorithm," The 2nd International Workshop on Intelligent System and Applica
- [17]L. Rastrigin, "External control systems," In Theoretical Foundations of Moscow, Russian, Nauka, 1974.
- [18]A. Griewangk "Generalized descent of global optimization," Optim. Theor. ,
- [19]A. Papoulis, "Probability Random Variables and Stochastic Processes," McG
- [20]R. C. Smith and P. Cheeseman, "On the Representation and Estimati International Journal of Robotics Research, 5(4), Winter 1986.
- [21]T. K. Paul and H. Iba, "Linear and Combinatorial Optimizations by Estima 9th MPS Symposium on Evolutionary Computation, IPSJ, Japan, 2002.
- [22]Y. Bar-Shalom, X. Rong Li, and T. Kirubarajan, "Estimation with Applicatio John Wiley & Sons, 2001.

### Citation

Helena Bahrami,Marjan Abdechiri,Mohammad Reza Meybodi,"Imperialist Comp Colonies Movement", IJISA, vol.4, no.2, pp.49-57, 2012.

This document was created with Win2PDF available at <http://www.daneprairie.com>.  
The unregistered version of Win2PDF is for evaluation or non-commercial use only.