

International Journal of Computer Science and Mobile Computing



A Monthly Journal of Computer Science and Information Technology

ISSN 2320-088X

IMPACT FACTOR: 6.017

IJCSMC, Vol. 7, Issue. 2, February 2018, pg.102 – 105

Artificial Intelligent System Optimization by using Artificial Bee Colony Algorithm

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Abstract: In this suggested method, the artificial bee colony ABC is proposed to optimize the whole system. The mathematical model of many traditional systems is very difficult and has multiple layers that will lead to slow response of this system and causes distorted results. Therefore, the ABC is best solution to solve the drawbacks of this system. ABC has three types of bees, where there are employed bees, onlookers and scouts. The employed bees are used to bring the food source and come to hive and dancing around this area. In addition, the employed bees that have not food source will be detected by a scout and try to bring new food. The onlookers choose the food based on dancing. Therefore, the optimization of the ABC is depends on choose of best food source (best signal of system) and will be registered. The proposed system is executed via Simulink Matlab. The results show that the system with ABC is more accuracy as well as the system is optimized.

Keywords: Artificial bee colony ABC, mathematical model of system.

Introduction:

The researchers proposed many methods to optimize the system. Particle swarm optimization is proposed to enhance the system [1], [2]. Some authors in [3] have defined swarm intelligence in the background of both humans. Some researcher developed the learning of natural algorithm [4]. In addition, the particle swarm optimization is applied in the difficult system to enhance the system based on global best position [5], and the artificial immune system is proposed on the bio system to modify the whole system [6]. The control system and its optimization is used for mathematical model [7]. Honey Bee Swarm for Numerical Optimization and Computational Intelligence Based on the behaviour of Cats is represented [8]. [9]. In [10] Artificial Bee Colony (ABC) Algorithm is suggested in complex system to improve the efficiency. Fuzzy logic controller and space vector modulation are applied to minimize the ripple of system performance [11], [12], [13].

In this paper, ABC is proposed to optimize the system based on best food source. The mechanism of this method will change the optimization system in each step and choose the best option of optimization based on employed bees.

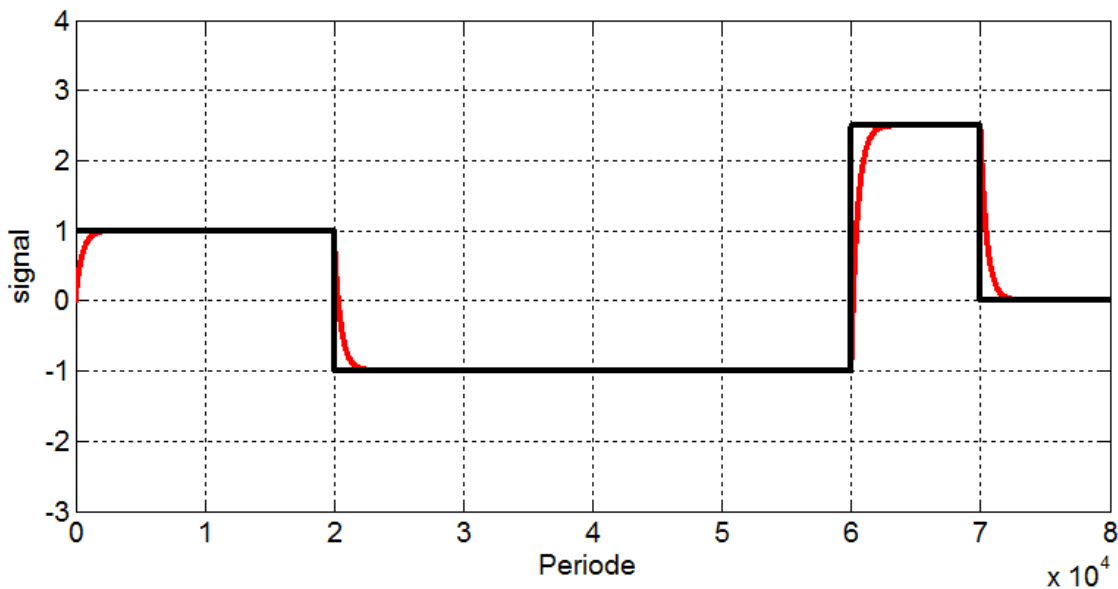
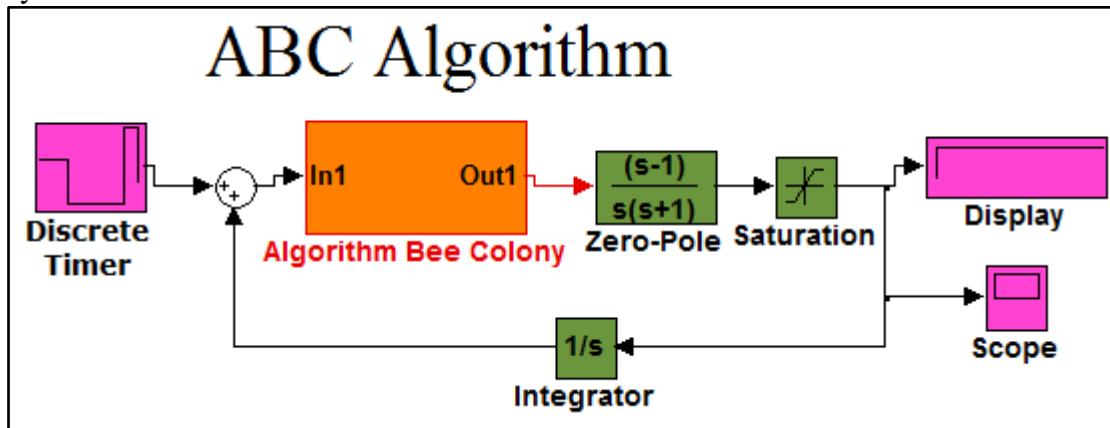
New Approach of ABC Method:

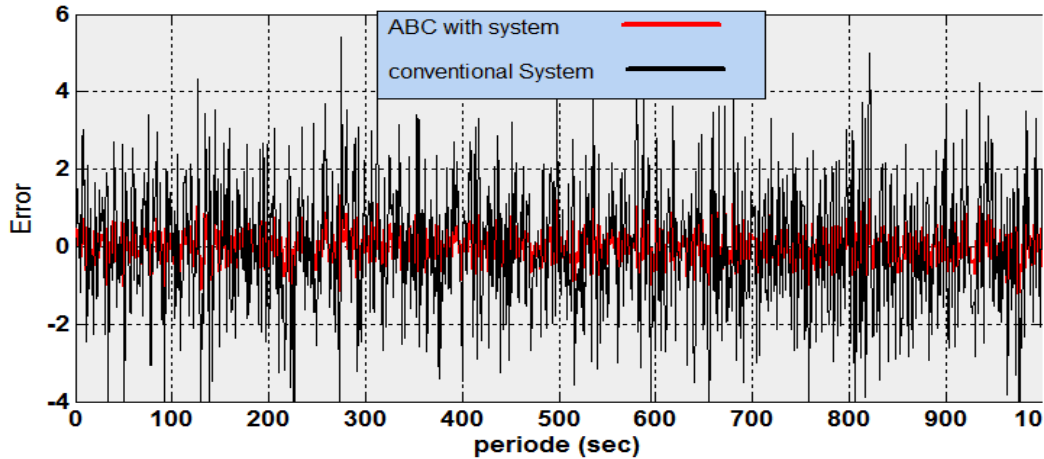
In this system, the artificial bee colony ABC is useful to optimize the whole system. The main steps of ABC are:

- 1- Initialize the employed bee randomly to bring food source
- 2- The solutions depend on employ bee number.
- 3- The position of food source is the possible of solution and optimize the drawbacks
- 4- The quantity of nectar is the fitness of related solution.
- 5- The employed bee bring the best food than old and remove the old from memory
- 6- The best food is choosing via onlookers and registered
- 7- The system will continue till get final best food source(best signals) to optimize the problems

Simulation Results:

The proposed system is built and executed by using Matlab. The inputs to ABC are the input discrete signal and actual signal and the output is optimized by ABC. The output signal from ABC is the optimized signal which is applied to mathematical model of system to improve the system.





Conclusion

From the proposed steps of ABC mentioned above, the results showed that the ABC make the error between desired input and actual output is approach to zero which means that the system with ABC becomes more simple as compare with traditional system and free of ripple. Finally, the output signal is more smooth and high accuracy with fast reaction.

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