AENSI Journals

Advances in Environmental Biology

ISSN-1995-0756 EISSN-1998-1066

Journal home page: http://www.aensiweb.com/AEB/

A Comparative Study of bees in the Quran and the Basic Computer Information Processing

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ARTICLE INFO

Article history:
Received 11 June 2014
Received in revised form 21 September 2014
Accepted 25 November 2014
Available online 29 December 2014

Keywords:
collective intelligence, bee colony, Scientific Miracles of Quran

ABSTRACT

Artificial intelligence (AI) is an offshoot of research on population organizing the factors affecting the population. Ant colony, the birds and the bee colony algorithm is a simple example of demographic system. A bee algorithm is defined for optimization using multivariate functions and intelligent behavior of honeybee population. By comparing the performance of this bee algorithm with verses of the Qur'an it becomes clear that the Quran mentioned bee algorithm as one of the main factors AI which is used to find the path to the nectar and other worker bees to infer the specified path. No deviation is known from the optimal path to sweep the bees. The aim of this paper is to address this issue as one of the miracles of the Qur'an, the main processing steps of which and finding the information they are reading is done by an intelligent algorithm.

To Cite This Article: Sadra Alipour and Farshad Barmaki., A Comparative Study of bees in the Quran and the Basic Computer Information Processing. ***Adv. Environ. Biol., 8(17),*** *1377-1381, 2014*

INTRODUCTION

Artificial bee colony algorithm (ABC):

Several new heuristic algorithms have been developed for solving combinatorial optimization problems and numerical functions. These algorithms can be classified into different groups, as, on the basis of population, based on iterative, random, deterministic, and so on. The algorithm works with a set of solutions and tries to improve them which are called based on population. One of the applications is the multiple iterations to find the optimal solution which is named as an iterative algorithm. If the algorithm uses a possible solution to improve collateralize, it is called chance or coincidence. Another classification can be simulated by algorithm considering the nature of the phenomenon. This type of classification includes mainly two important groups of the population algorithms:

Evolutionary Algorithms (EA) and algorithms based on collective intelligence. Different ways are recommended to model the behavior of a swarm of bees and to solve problems of combination. They have created an idea of robots foraging behavior of bees. Usually, all the robots in are same the physical and performance features, so that each robot can be randomly substituted (Journal: Applied Soft Computing, Volume 8). They also have developed a model feed leading to the emergence of collective intelligence which consists of three essential components: sources of food, workers who are seeking food and workers who do not seek food. This model defines two outstanding behaviors of using a nectar source and dropping a source. A new routing algorithm called the Beehive which is determined by the method of assessing the relevance and is inspired by the bees. In the beehive algorithm, bees are flying steward of the areas that are called food areas. On the other hand, information on specific areas is delivered to local areas for routing updates. The works presented in the previous paragraph includes a mixture. There is only a numerical optimization algorithm based on the collective intelligence of bees. Yang suggested a virtual bee algorithm (VBA) to optimize the performance of the functions of the numerical solution. For functions with two parameters, a group of virtual wasps are produced and population randomly begins to move in the specified space. When the bees found the amount of nectar corresponding with function encoded values, begin to interact with each other. The solution to the optimization problem can be obtained from the intensity of the interaction of bees. For optimization of multivariable functions, Karaboga stated the artificial bee colony algorithm (ABC) which is different from the virtual bee algorithm (Pham, D.T., Karaboga, D.: Intelligent Optimization Techniques).

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Advances in Environmental Biology, 8(17) September 2014, Pages: 1377-1381

Matching Quran verses with artificial bee colony algorithm:

However, with the implementation of the above discussions, we can achieve amazing results with Quran verses:

And your Lord inspired to the bee, "Take for yourself among the mountains, houses, and among the trees and [in] that which they construct (Al-nahl, 68).

Then eat from all the fruits and follow the ways of your Lord laid down [for you]." There emerges from their bellies a drink, varying in colors, in which there is healing for people. Indeed in that, there is a sign for a people who give thought (Al-nahl, 69).

Verse 68 of Al-nahl precisely notes the way that bees have to travel and the paths specified in the commentary as easy to come by and when enough of the plants were used, get in the Way of your Lord, and back into the honey making house, the ways in which God has placed them for you convenience and submissive. God has given you an intelligence which as much as you are away from my house you can again return upon, the way and you will be obedient, and never lost. Here, the words fruit means flower and bloom, in this case and extract of the flowers and blossoms that will put the heal in honey.

The meaning of this verse is that God has the instinct of bees that have inspired her vigor and the story of bees and military social life and the character and nature. It is something strange and surprising, and perhaps this has made the eclectic system addressed to the address of the group for the Prophet (pbuh) by stating that "and you're Lord revealed".

And he said, this is the theme that God inspired the bee, and apparently intended as a place are the place of beehives. And that fact that it is said that the bee eats the fruit, although bee does not eat fruits and often sits on a flower that is because the food of bees is from the same raw materials fruit in bloom, and still not great and is not cooked. I

In other words, in Tafsir al-Mizan Tabatabaie has an explicit reference that all the way was inspired by God to the bee , the interpretation of which is mentioned in the following quotes and comparison with the Bee algorithm on programming and data processing;

The statement of God that "bees would have to eat" suggests that the meaning of eating as taking and bringing home so that the honey taken from the fruits is taken houses and stored, and addition of, "Living" in the word "God" in the sentence "Your God" is to imply that all work and traffic Bee is done by inspiration (Al-Mizan , vol 12, p 425).

This case is discussed in Majmae al-Bayan; and it comes to the ways in which God has placed him and are prepared to walk smoothly. The word "ways" indicates the promise of a warrior. Ghatade Says: "ways" reach to the "honey" that the bees must be obedient to God. (Al-Bayan in Tafsir al-Quran, vol. 14, p. 10).

Nemone Interpretation discusses differently in this topic: Lord revealed to the bee!. The tune will change surprisingly while continuing the previous discussions on various divine things and explain the mysteries of creation, discusses the word "bee" (An-Nahl) and then to be with your honey but in the form of a mysterious divine mission and inspired by the "revelation".

First says: "And your Lord has revealed bee to select the homes of the mountains and the trees and build a scaffold made by people". "Revelation" here is the instinct command and unconscious motivation and inspiration that God has created in different organisms. The mission of the bees is mentioned in the verse above and this is probably due to the fact that the issue of adequate housing is a condition of life. Followed by it, other activities become possible. After the second mission of the Bee starts, as Qur'an says that we have inspired him: "Then eat of all the fruits." "And follow the ways that Lord has easily identified for you ". Finally, the last stage of their mission (as a result) is stated as: "Special drink comes out of the bees honey with different colors" (Nemome, vol. 2, p. 581)

In this part of the verse the paths marked by bees are mentioned and various wines that worker bees in ABC's learning algorithms as mentioned below: Algorithm ABC shows the location of a food source for a solution to the optimization problem and the nectar of food associated with the competency solution. The number of worker bees or wasps audience is same as the number of solutions in the community. In first step, ABC initial population is randomly distributed.

P (G = 0) solutions SN (food stands), where SN represents the size of the population:

Also, in the same verse in the Qur'an interpretation p. 644 it is noted that, Ants and bees led to form assembly, governance, housing and prepare the means of life and the guidance developed by the Children born in the early days of the breast, nutrition and feeding.

In this verse, God from Moses quotes, the step of directing "genetic" is mentioned (Taha / 50) The inclusion in this direction and ways to bee is a pre-determined path of development and God put it there in the nature of the creations.

Advances in Environmental Biology, 8(17) September 2014, Pages: 1377-1381

In the bee colony algorithm (ABC) Bees are three groups:

The worker bees, explorer and leading (scout). Honey bee in the dance region to make the decision to choose a food source remainsis called Explorer Bee and the honey bee, which is marked by the food supply is called worker bee and the Honey bee doing the random search is called scout or leader.

The algorithm ABC, for the first, half of the bees is workers and the other half are explorers. For each food source, there is only one worker bee. In other words, the numbers of worker bees are equal to the number of food sources around the hive. Worker bees who are exhausted due to work in the food supply are called leader explorers (Holland, J.H.: Adaptation in Natural and Artificial Systems).

Below are the main steps of the algorithm:

(A) The worker bees place in food sources in the memory;
(B) The bees search for food sources in the memory;
(C) A leading bees to search for new food sources;

Stages of information processing in the Quran and Clooney programming:
The algorithm ABC, as well as verses each cycle consists of three stages of the search:

Firstly, sending the worker bees to food sources and then measuring the amount of nectar; Verse refers to the subject in this way: Colorful wine comes out of his belly. Select a food source by explorer bees after sharing information by worker bees and the amount of food nectar, bees leading set and then sending them on their food sources. At initialization, the position of food is randomly set, selected by the bees and the honey are determined. Then, the bees in the hive, the bees come and jam every resource to wait dancing in the region shared within the hive.

In the second stage, after sharing the information, each worker bee goes to the food source which he visited in the previous cycle and saved as the food source in his memory, then eats the result of fumigation "and then choose a new food source using visual information which is in the neighborhood of the same one.

In the third stage, an observer bee took up the areas of food, depending on the type of information distributed by the worker bees in the dance. Hence, the dancer worker bees which carry higher nectar encourage the visitors to areas with higher food source of nectar.

Adding the word “way” to the word "your God" is for implying that all coming and going by the Bee is based on inspiration. After entering the selected area, he selects a new food source in his neighborhood depending on the selection of visual information. Visual information is based on the direction of the food source. When a food source is released by bees nectar, a new food source is randomly assigned by scout bees and replaces the left source. In this model, in each cycle maximum one scout searches for a new food source and the number of worker bees and wasps that are the spectators came out.

Below, the issue is mentioned completely; Verse 68 of Surah Nahl:

The word (Ohi) means inspiration. The word (Rabak) is addressed to the Prophet Muhammad (pbuh). God in this verse like the previous verses stated another reason for the existence and uniqueness of the Lord and said to his prophet: “Oh! Muhammad Lord inspired the bee, the inspiration that select homes form mountains and the trees and scaffolding to make honey. However, this action have to be a reason for the existence and uniqueness of God, delicious drink and healing which has been submitted to human being.

Lord says the bee: Build honey house in some hills and some trees and some scaffolding not all because some of them and some of the positions are not competent to make Beehives. It is because we see that Bee in all positions cannot make a house. one of the wonders of honey bee is the way of making houses (octagonal) . If the beehives were in another form and shape, for example, along circular or triangular, or square, or so slit pores were created between them which were not used for making honey. But now that we are made in the form of special octagonal all of them are used and even as much as a centimeter of them is not useless. The revelation and inspiration that God has given to bees to select a king for themselves (queen) and obey his commandments. It would be the creation larger than their size and God has inspired them: On every in, concierge should be deployed at the entry of foreign door.

Including that: the bees removed from their homes and go to the circulation on the flowers and plants, and then on the way back to the house they are never lost.

Because bees do not eat the fruits, but eat flowers, it is clear that the word (fruit) means flowers and plant.

And when you used enough of the plants, Lord shows the Road back into the house, the ways which God has placed them for you easy and obedient. God has given you intelligence that you would not get lost away from home. Again, upon return, you will be obedient to the authority and never get lost.

This obviously means that the honey bee to get out of the mouth, making the glaze. But as raw materials in the abdomen of honey bees are transformed and made. It says in the following that honey bee removed from the abdomen and it comes from the mouth and head out: It will drain into the glaze to make the beehive.
The colors are different; White, yellow and red.

Advances in Environmental Biology, 8(17) September 2014, Pages: 1377-1381

White honey is produced by young, yellow honey by old bee and red honey bee is produced by quite old bee. However, in Alkashf interpretation, it says: Different colors of honey is due to the fact that Bees use different flowers and plants (Asan interpretation , c. 9, p. 228).

Food sources of solutions is according to formulas in basic computer data processing and each solution (food source) (i = 1, 2,..., SN) is in next xi vector D - D. Here, D is the number of optimization parameters. After initialization, the population situation (solutions) is repeated in the cycle, C = 1, 2,. . . , Cmax; that C is the search process of Worker, explorer and scout bees. An artificial worker or spectator bee probably changes in the position of (solution) in its memory to find a new food source and testing of nectar (fitness value) of new sources (new solution) is. The real bee produces new food sources of food resources in the region based on the comparison process which is dependent on the data collected, visually, by bee. In this model, the new source of food production and food supply situation is based on a comparison process. However, in this model, artificial bees do not use any information in comparison. They randomly chose a food source position and changes on the resources of his memory as described in (2.2) generated.

Provided further that the new source of nectar source for bee's memory is preserved previously, the new position will be maintained and the past is forgotten. Otherwise, he keeps his previous position. Once the search process of all the worker bees is complete, they feed on nectar sources (solution) and information about the status of the spectator is shared with bees in the dance. An observer bee evaluates the nectar of information from all the worker bees and selects a food source which is more likely to be to the amount of nectar. As in the case of a worker bee, produce changes in position (solution) in its memory and check the nectar of the selected source (solution). The nectar that it is more than the previous offers makes Honeybees to maintain the new position and forget the previous one. Observer bee selects a food source with respect to the risk associated with the food source, pi, which is calculated using the following expression:

$$p_i = \frac{\text{fit}_i}{\sum_{n=1}^{\text{SN}} \text{fit}_n}, \qquad (2.1)$$

Where *fit i* is the merits of the solution I which is evaluated by worker bees. The assessment is proportional to the amount of nectar food source at position i. And SN is the number of food sources of the number of worker bees (BN). In this way, the worker bees are sharing their information with observer bees. In order to produce a food selected from the previous position, ABC uses the following words:

$$v_{ij} = x_{ij} + \phi_{ij}(x_{ij} - x_{kj}), \qquad (2.2)$$

Where k ∈ {1, 2,. . . , BN} and j ∈ {1, 2,. . . , D} is randomly selected index. Although K is determined randomly, it is different from i. φi, j is a random number between -1.1]which controls the location of food sources neighbors around xi, j, and visually provide the Food and shifts in the position of the neighboring bees.

2.2 Equation of various parameters xi, j and xk, j indicates that change in the position xi, j, decreases. Thus, in a search for the optimal solution in the search space, is periodically reduced step by step. If the parameter is generated by the operation is more that predetermined ones, parameters can be selected as an acceptable value. A food source whose nectar is released by the bees is replaced by a new abandoned food source by scout bees. In the ABC algorithm this is generated by the random simulation and replaced by the abandoned supplier.

In the algorithm ABC, if a position is not more than a predetermined number of cycles, the assumed food source is left. After selecting the source, location, vi, j produced by the artificial bee assess its performance with xi, j comparison, if a new food nectar is better than the previous source, it will replace the previous memory. Otherwise, it will keep the old. In other words, a greedy action selection mechanism between the previous and current food sources is done. The algorithm ABC actually uses four different selection processes:

(1) Global selection process by artificial observer bees to explore promising areas described in (2.1),

(2) A local selection process in artificial worker bees done by bees and fans, according to local information (the real bee, this information, including color, shape and scent of flowers) (bees could not be detected until the nectar source convenient location and the resources are growing, they are segregated by scent) to neighboring food source around in memory source defined in (2.2), Otherwise, bee keeps the current in memory.

(4) A random selection process conducted by the scout bees.

The above explanation is clear that there are three control parameters that are used in the original ABC:

- The number of food sources that is equal to the number of worker or spectators bees (SN),
- Limit value (the value of limit),
- Maximum number of cycles (MCN)

In case of bees, using the agent for measuring how quickly will the bee colony discover source and exploit new food. Similarly, one can employ it artificially to measure the speed with which a solution is possible and show good quality solutions to complex optimization problems can be discovered. Bee colony survival and development depend on fast and efficient use of the best discovered food sources.

Similarly, the right solution of difficult engineering problems is related to the rapid discovery of good solutions. For specific issues that must be solved in real time, a powerful search process, the processes of exploration and exploitation should be done together. The algorithm ABC, observer and worker bees do the operation process in the search space, scout bees control the discovery process.

Conclusion

The Beehive is a new routing algorithm which is a method of communication and specific assessment inspired by honey bees. In the beehive algorithm, steward Bees fly along the areas called food areas.

On the other hand, they provide information on specific areas routing updates to local areas. The works presented in the previous paragraph includes a mixture but only a numerical optimization algorithm exists based on the collective intelligence of bees.

In verse 68 of Quran it is said that Lord inspired to the bee, "Take for yourself among the mountains, houses, and among the trees and [in] that which they construct (Al-nahl, 68).

Then eat from all the fruits and follow the ways of your Lord laid down [for you]." There emerges from their bellies a drink, varying in colors, in which there is healing for people. Indeed in that, there is a sign for a people who give thought (Al-nahl, 69). It means that healing is in plants and flowers which the bees make honey from.

And the collective intelligence of a bee colony is used as a computer program for processing information from the embedded artificial intelligence and play a crucial role in the miracle of the Quran over 1,400 years ago. And more miracles of this divine book are shown on the fact that an illiterate person could not discuss an exact scientific issue. Yes, creationism, intelligent, disciplined and honey of the bees is reasoning for those who believe and the sign and proof of the existence and uniqueness of their creator. It is also a sign for those who reject to believe in God.

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