HEALTHCARE SERVICE IN CLOUD AND IOT USING PSO & ABC OPTIMIZATION TECHNIQUES

[1]Silambarasan.K, Research Scholar, Center for Information Technology and Engineering, Manonmaniam Sundaranar Unviversity, Abishekapatti, Thirunelveli-629012, Tamilnadu, India,
[2]Dr.P.Kumar, Assistant Professor, Center for Information Technology and Engineering, Manonmaniam Sundaranar Unviversity, Abishekapatti, Thirunelveli-629012, Tamilnadu, India
[3]Raghavendran S, Research Scholar, , Center for Information Technology and Engineering, Manonmaniam Sundaranar Unviversity, Abishekapatti, Thirunelveli-629012, Tamilnadu, India and Assistant Professor, Vel Tech Rangarajan Dr.Sagunthala R&D Institute of Science and Technology, Chennai,

ABSTRACT

Nowadays Internet of Things and cloud computing are important for internet service mainly healthcare service to send and receive the data. Optimization techniques is a vital role to reduce execution time and increase system efficiency. In existing system, the patient needs such as medical data's; CPU Utilization, processing time…which needs more execution time with use of algorithm such as Cuckoo search and ABC (Artificial bee Colony). In this report examines the consequences of proposed system in which Internet of Things (IoT) and cloud computing using Particle Swam Optimization (PSO) and Artificial bee Colony (ABC) on providing healthcare services which reduce execution time and improve system performance. After studying these two algorithm Artificial Bee Colony and Particle Swam Optimization which gives better performance.

Key words: *Internet of Things (IoT), Particle Swam Optimization (PSO), artificial bee Colony (ABC)*

1. INTRODUCTION

Technology is very much essential to all department such as Information of communication, Business field, teaching service, e-health service. Today technology helps many patients to get fast treatment based upon their requirements and transfer the medical records from one place to another place in very short time. Cloud computing is one of key used in internet service and this is very useful to health care service especially in e-health service and bioinformatics.

In this paper discuss about how the system performance and how much the execution time reduce by combining two algorithm Particle Swam Optimization (PSO) and Artificial bee Colony (ABC) algorithm.[1] J.Yang describes that the medical records can be transferred from one place to another. System architecture of big healthcare overcome the technology challenge and reduce the medical expense. [2] L.A Tawalbeh analyzed the healthcare service

of patient requirement such as patient details, medical scanning records are enabled through mobile cloud computing and big data. Particle Swarm Optimization (PSO) algorithm [3-8] is a computation method to get optimum solution from its maxima or minimum condition. This optimization algorithm minimize the execution time and improve the system performance. [9-10]Artificial Bee Colony (ABC) algorithm is nothing but to find highest amount of nectar with the help of a single bee and that bee tells information to that group and this algorithm was inspired from nature. Similarly, it is also optimization algorithm and it provides population based search procedure. This algorithm also improve system efficiency and reduce the execution time in e-health service.

2. PROPOSED METHOD

The architecture of the proposed is shown below. This block diagram consist of four levels such as stakeholders, IHS tasks, cloud broker, IHS devices and network administrator. The above four levels are important for network communication with the help of cloud computing. Stake holder is used for identified and analyzing the patient needs. IHS tasks such as patients records, fragmented health care system, care transition, family caregivers, summary of treatment etc…these are the different types of tasks to get the information from health care service.

Based on the patient requirement varies tasks are asked and the stake holder identify and analyze the data and given this query to cloud broker.

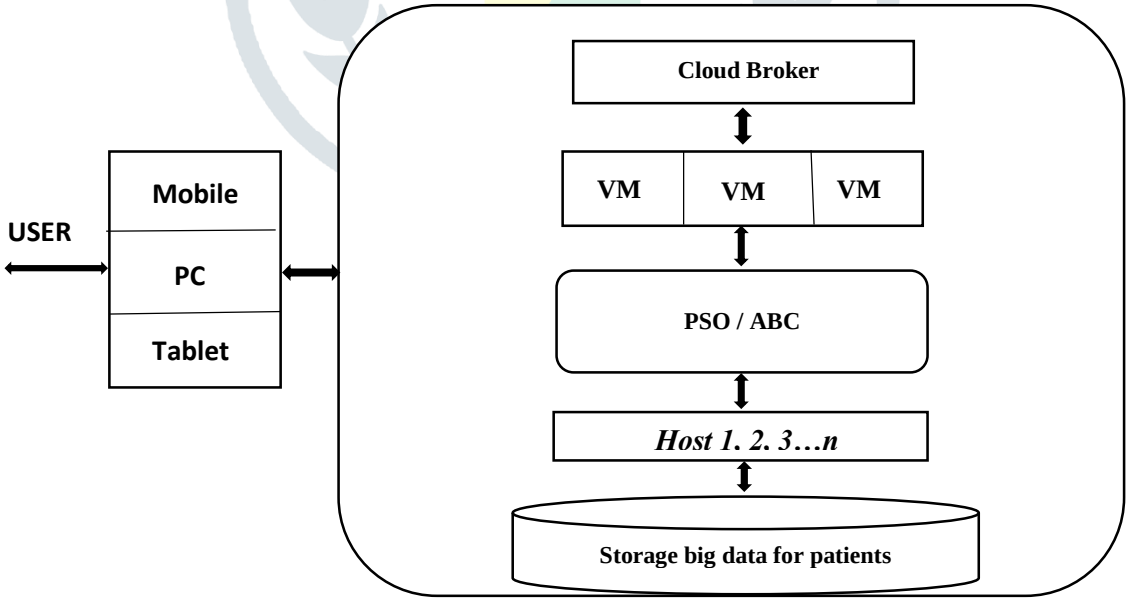

Figure1: Architecture of proposed work

Service as service is used in healthcare field, Cloud environment has varies application server. IHS device such as PC, smart phone, Tablet, Medical equipment's are used. The

benefits of Virtual Machine (VM) is consists of a set of instruction, sharing the resources and see the workload fluctuation from time to time. Figure 1 is the architecture of proposed work. Particle Swarm Optimization and Artificial Bee Colony are the two algorithm used to get better system efficiency and task processing time.

3. PARTICLE SWAM OPTIMIZATION (PSO)

Particle swam optimization (PSO) is nothing but an optimization technique taken from food searching character of bird flocking or fish schooling. This technique is used to find approximate solution of complex maxima and minima problem.

Algorithm

i. Evaluate the particle randomly.
ii. Find the fitness of each particle.
iii. Each particles velocity and position is updated.

This three condition are executed until stop condition met. PSO minimize the execution time and boost up the processing time.

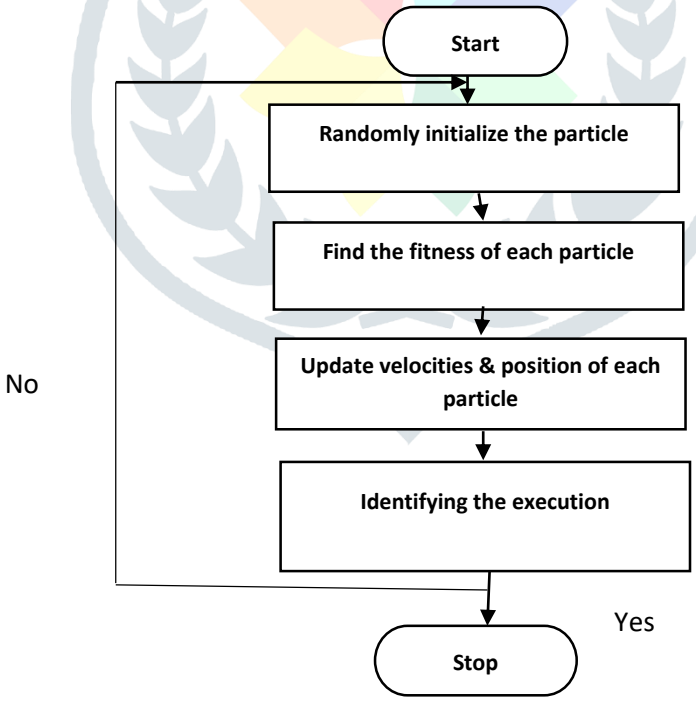

Figure 2: Flow chart of PSO

Figure 2 is the flow chart of Particle Swam Optimization. PSO algorithm consist of three important steps.

4. ARTIFICIAL BEE COLONY (ABC)

ABC algorithm is one of the optimization technique inspired by food searching habit of honey bee. Figure 3 is the flow chart of the algorithm.

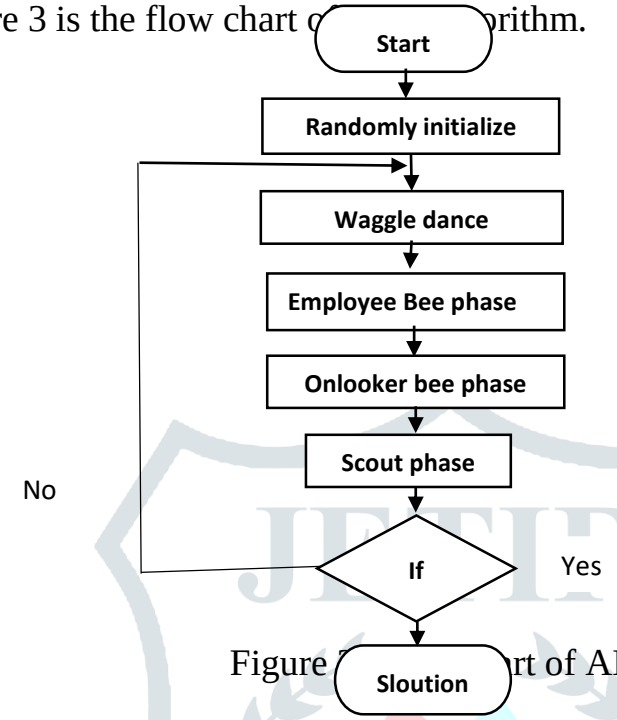

Figure 3 Flow chart of ABC

It consists of four main steps such as initialization step, employee bee step, onlooker bee step and scout step. It is used to find large amount of nectar by using employee and onlooker bee.

Algorithm

i. Evaluate initialize population x_i randomly.
ii. Find the fitness of the population.
iii. New solution is generated by using employee bee section.
iv. Share the knowledge of onlooker bee and generate new solution
v. Scout bee is used to find large amount of nectar and memories it for best result.

5. EXPERIMENTAL ANALYSIS

This section explain the experimental analysis of the proposed work. Figure 4 describes the graph of performance analysis of proposed work.

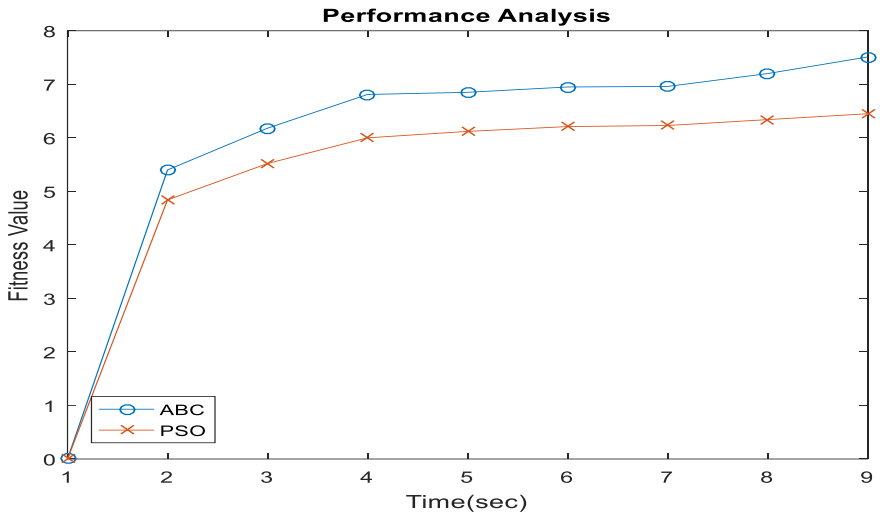

Figure 4: Graph for Performance Analysis of Proposed work

Here two algorithm are used ABC and PSO are used, among this two algorithm ABC algorithm is best. The coding are executed in MATLAB and cloud sim bundle. From this analysis ABC algorithm the execution time increases by increasing the fitness value. For 9 sec the fitness value reaches 7.5 in ABC algorithm and in PSO optimization technique for 9 sec, the fitness value reaches 6.3. On comparing these two algorithm ABC technique is very good technique to reduce the execution time. These algorithms are utilized by the virtual machine it is used to share the policy and the tasks are executed sequentially. The execution time is not affected by the number of incoming tasks for using the space shared policy.

6. CONCLUSION

Cloud computing and IoT play a vital role in health care service, Particle Swam Optimization and Artificial Bee Colony are the two algorithm used in this proposed system, among these two ABC algorithm is best for system performance. These are very easy to implement, flexible to handle, reduce the execution time for finding the solution of any complex problem. Here use two simulations such as MATLAB and Cloud Sim was done and this optimization technique boost the system performance very well.

REFERENCES

[1] Yiming Miao, Yulei Wang, Ma, Yujun, Jun Yang and Wei Li. "Big health application system based on health internet of things and big data." IEEE Access 5 (2017): 7885-7897.

[2] Lo'ai, A. Tawalbeh, Elhadj Benkhlifa, Rashid Mehmood, and Houbing Song. "Mobile cloud computing model and big data analysis for healthcare applications." IEEE Access 4 (2016): 6171-6180. [3] Li, Zhulin, Haiyan Lv, Cuirong Wang, and Tongyu Xu.

"Application of PSO algorithm based on improved accelerating convergence in task scheduling of cloud computing environment." International Journal of Grid and Distributed Computing 9, no. 9 (2016): 269-280.

[4] Nzanywayingoma, Yang Yang and Frederic. "Analysis of Particle Swarm Optimization and Genetic Algorithm based on Task Scheduling in Cloud Computing Environment." Analysis8, no. 1 (2017).

[5] Pratish Kumar Mahalaha, Pratima Gautam and Rajendra Gupta; "Improvement in Execution Time of PSO to Find Target Object in Running Environment of A* Algorithm" International Journal for Research in Applied Science & Engineering Technology (IJRASET) ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887 Volume 5 Issue VIII, August 2017.

[6] Li, Tzuu-Hseng S., Chih-Yin Liu, Nien-Chu Fang, Ping-Huan Kuo, Cheng-Hui Li, Ching-Wen Cheng, Cheng-Ying Hsieh, Jie-Jhong Liang, Li-Fan Wu, and Chih-Yen Chen. "A three-dimensional adaptive PSO-based packing algorithm for an IoT-based automated e-fulfillment packaging system." IEEE Access 5 (2017): 9188-9205.

[7] Ngatman, Johan Mohd Sharif, Mohd Farhan, and Md Asri Ngadi. "A study on modified PSO algorithm in cloud computing." In Student Project Conference (ICT-ISPC), 2017 6th ICT International, pp. 1-4. IEEE, 2017.

[8] Xu, Anqi, Zhenqiang Mi, Yang Yang, and Zenggang Xiong. "Task scheduling algorithm based on PSO in cloud environment." In Ubiquitous Intelligence and Computing and 2015 IEEE 12th Intl Conf on Autonomic and Trusted Computing and 2015 IEEE 15th Intl Conf on Scalable Computing and Communications and Its Associated Workshops (UIC-ATC-ScalCom), 2015 IEEE 12th Intl Conf on, pp. 1055-1061. IEEE, 2015.

[9] Xu, Anqi, Zhenqiang Mi, Yang Yang, and Zenggang Xiong. "Task scheduling algorithm based on PSO in cloud environment." In Ubiquitous Intelligence and Computing and 2015 IEEE 12th Intl Conf on Autonomic and Trusted Computing and 2015 IEEE 15th Intl Conf on Scalable Computing and Communications and Its Associated Workshops (UIC-ATC-ScalCom), 2015 IEEE 12th Intl Conf on, pp. 1055-1061. IEEE, 2015.

[10] Celal Ozturk Karaboga, Dervis. "A novel clustering approach: Artificial Bee Colony (ABC) algorithm." Applied soft computing 11, no. 1 (2011): 652-657.

[11] Kumar, Ranjan, and Sahoo.G. "Cloud computing simulation using cloudSim." arXiv preprint arXiv: 1403.3253 (2014).