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Modified Artificial Bee Colony (ABC) Algorithm using Dynamic Technique

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***Abstract* - The artificial Bee Colony Algorithm is a maximum optimization technique. It has been used in various research papers. In this paper, the dynamic technique has been used in Artificial Bee Colony Algorithm, before this algorithm used the greedy technology of the algorithm. But due to some deficiency in the greedy technique, it has been replaced by the dynamic technique. Here in the Artificial Bee Colony Algorithm, an attempt has been made to overcome the lack of hygiene by using the dynamic technique. The methodology is depicted in this paper. Using this methodology, you can smooth access to data in network communication, reduce data access time, and also reduce energy consumption.**

Keywords: **Artificial Bee Colony (ABC) Algorithm, Internet of Things (IoT), Wireless Sensor Network (WSN), Cluster Head (CH)**

I. INTRODUCTION

Artificial Bee Colony (ABC) algorithm may be a nature-inspired optimization algorithm supported intelligent foraging behavior of honey bees (Karaboga&Akay 2009). ABC Algorithm may be a population-based optimization method, which is employed in problems where the group or the set of solutions is required to seek out. This algorithm is employed in many applications like electric power systems, parallel and grid computing, data clustering and image analysis, a computing application, signal processing, and communication. The colony of artificial bees consists of three groups: employed, onlookers, and scout bees. The employed bees randomly look for food source positions (solutions). Then, by dancing, they share information (communicate) that food source, like nectar amounts (solutions qualities), with the Onlooker bees waiting within the dance area at the hive. The duration of dance is proportional to the nectar's content (fitness value) of the food source being exploited by the employed bee. Onlooker bees watch various dances before choosing a food-source position, consistent with the probability proportional to the standard of that food source. Consequently, an honest food-source position attracts more bees than a nasty one. Onlookers and scout bees, once they discover a replacement food source position, may change their status to become employed bees. When the food-source position has been visited (tested) fully, the employed bee related to it abandons it, and should another time become a scout or onlooker bee. During a robust search process, exploration, and exploitation processes must be administered simultaneously (Kang *et al.*, 2009). Within the ABC algorithm, onlookers, and employed bees perform the exploration process within the search space, while scouts control the exploration process (Karaboga 2009). The goal of bees within the ABC model is to seek out the simplest solution. Therefore, the position of a food source represents a possible solution to the optimization problem, and therefore, the nectar amount of a food source corresponds to the standard (fitness) of the associated solution.

The sensor nodes are easily configurable to several specific applications. However, they're powered only by irreplaceable batteries with limited energy. Nevertheless, their processors have limited processing power, and therefore, the communication channels employed by the sensor nodes are usually in low bandwidths. By considering these constraints of sensor nodes, innovative techniques are required to enable communications. Not only communication is required, but also the network lifetime should belong to the maximum amount as possible within the applications of WSNs. Communication is the main factor of energy dissipation in sensor nodes. The dissipation depends on the space between communicating elements as source and destination. The sensing unit, processing unit, and transceiver unit on sensor nodes have also importance on energy consumption (Martin Enzinger 2012). Having limited sources necessitate energy-aware routing protocols running on the sensor nodes. The protocols running on these networks should be simple-structured, fast executable, and with low power for successful applications. Clustered routing mechanisms are particularly more suitable for wireless sensor networks with continued data flowing. In recent years, the routing protocols using swarm-based optimization algorithms present an alternate way of efficient data gathering techniques on sensor network 131 routings. The algorithms running on the nodes should be in simple forms providing fast execution and tiny energy consumption. Ant Colony Optimization (ACO) modeling ant's behavior of finding food sources may be a candidate method for multi-path routing employing a swarm-based algorithm to maximize network lifetime in event-based applications. Particle Swarm Optimization (PSO) simulates bird flocking which is employed to make clusters and to define cluster heads during a WSN. Honey-bees are among the foremost closely studied social insets. Their foraging behavior, learning, memorizing, and knowledge sharing characteristics have recently been one of the foremost interesting research areas in swarm intelligence. Artificial Bee Colony (ABC) algorithm is applied within the clustering of WSN.

II. NEED AND SIGNIFICANCE OF THE RESEARCH

The previous algorithm performance was not better for optimization and takes more time as well as maximizing energy consumption and not cost-effective. The significance of the research is that the algorithms are not given the simplicity, flexibility, memorization, optimal solution and robustness. The need of research is to improve simplicity, flexibility, memorization, optimal solution and robustness. Use of fewer control parameters not compared too many other search techniques. Not ease of hybridization with other optimization algorithms. Ability to handle the objective cost with not stochastic nature. Not ease of implementation with basic mathematical and logical operations.

III. REVIEW OF RELATED STUDIES

Yinggao Yue *et al.,* [1] presented the information assortment could be an elementary operation in numerous mobile wireless sensing element network applications. Ancient information assortment strategies solely specialize in increasing the quantity information assortment or reducing the network energy consumption that is why it tends to design the planned heuristic rule to conjointly take into account cluster head choice, the routing path from standard nodes to the cluster head node, and mobile Sink path coming up with optimization. The planned information assortment rule for mobile Sinks is, in effect, supported the artificial bee colony. Simulation results show that, compared with different algorithms, the planned rule will effectively scale back information transmission, save energy, improve network information assortment potency and responsibility, and extend the network period.

Satyajeet R. Shinge *et al.,* [2] suggested the WSN consists of an oversized variety of sensing element nodes that area unit deployed over a section to perform local computations supported data gathered from surroundings and send these data to the most location. Every sensing element node is supplied with a restricted battery- power. The energy, storage capability, and communication capability of sensing element node area units are restricted. One of the basic style challenges in planning a Wireless sensing element Network is to maximize the network period.

Yan Song *et al.,* [3] proposed an artificial bee colony algorithmic rule that is predicated on AN RBF radial basis neural network trained with a random gradient technique is intended. Simulation results show that the planned algorithmic rule solves the contradiction between power consumption and real-timeliness effectively. Once the exploitation of this improved network system structure to send transmission info, it shows obvious superiority in terms of the high potency and real-timeliness of transmission.

R. Vijayashree *et al.,* [4] proposed the cluster head election relies on the residual energy of the node. Simulations results show that, as compared with different algorithms such as stochastic process and Ant Colony improvement, the planned algorithmic rule will effectively cut back information transmission, save energy, improve network information assortment potency, and dependableness, and extend the network period.

Hashim A *et al.,* [5] presented these communication holes can't be eliminated even once the preparation is completed in an exceedingly structured manner. In either case, the ensuing inter-node distances could degrade the performance of the network. They propose the associate degree increased preparation algorithmic program supported Artificial Bees Colony. The ABC-based preparation is bound to extend the period by optimizing the network parameters and restricting the overall variety of deployed relays. Results show that the projected approach improves the network period significantly in comparison to solutions according to within the literature like Shortest Path 3D grid preparation algorithmic program.

Famila, S *et al.,* [6] proposed a method to facilitate the best choice of Cluster Heads, during this paper, they tend to propose Associate in Nursing Improved Artificial Bee colony improvement based mostly on clump algorithmic rule by utilizing the deserves of bomb Explosion methodology and Cauchy Operator. This incorporation of GEM and Cauchy operator prevents the Artificial Bee Colony algorithmic rule from stuck into native optima and improves the convergence rate.

Famila, S *et al.,* [7] suggested the core objective of dominant topology, protective energy, and lengthening the life cycle in device networks is very indispensable for maximizing its life. Meta-heuristic improvement algorithms are found to be optimum in facilitating the method of cluster head election and cluster. The potential of bomb Explosion and Cauchy operator are embedded within the Onlooker Bee and scout bee section for fantastic improvement within the degree of exploitation and exploration of looking out that aids within the optimum election of cluster heads. The simulation results of IABCOCT prove that the rate of device nodes is decreased for enhancing network life.

Celalöztürk *et al.,* [8] proposed the usage and development of wireless detector networks will increase, issues associated with these networks area unit being discovered. During this paper, an artificial bee colony algorithmic rule is applied to the dynamic preparation of mobile detector networks to achieve higher performance by attempting to extend the coverage space of the network.

Karaboga, D *et al.,* [9] presented the several novel architectures, protocols, algorithms, and applications that are protected and enforced. The potency of those networks is extremely passionate about routing protocols directly poignant the network life-time. Bunch is one every of the foremost fashionable techniques most well-liked in routing operations. The results of the experiments show that the

substitute bee colony rule-based mostly bunch will with success be applied to WSN routing protocols. the associate degree increased preparation algorithmic program supported Artificial Bees Colony. The ABC-based preparation is bound to extend the period by optimizing the network parameters and restricting the overall variety of deployed relays. Results show that the projected approach improves the network period significantly in comparison to solutions according to within the literature like Shortest Path 3D grid preparation algorithmic program.

ManitaDangi *et al.,* [10] presented it consumes energy to transmit, forward, and receive the info over the network. Network lifetimes depend on the energy of nodes, depends on the processing power of node, memory, and transmitter power. During this paper, they focus to keep up the utmost lifespan of the network, throughout information transmission in an Associate in Nursing economical manner.

Y. Lu *et al.,* [11] proposed a mobile sink-based path optimization strategy in WSNs mistreatment artificial bee colony formula is projected. Second, an associate degree improved artificial bee colony formula is projected to resolve the matter. On the one hand, the additive issue is introduced to the position update of the utilized bee stage to hurry up the convergence of the formula. On the opposite hand, the Cauchy mutation operator is conferred to extend the range of the possible resolution and enhance the worldwide searchability of the formula. The simulation results show that the projected formula is best than the normal ways within the aspects of energy potency and therefore the period performance of information assortment.

Zohreh Karimi Aghdam *et al.,* [12] presented the package testing may be a method for deciding the standard of the software package. Several tiny and medium-sized packagescome will be manually tested. Notwithstanding, because of the widespread extension of the package in large-scale comes, testing them is going to be extremely time intense and dear. Hence, automatic package testing is taken into account to be an answer which might ease and alter significant and cumbersome tasks concerned in package testing.

Yang Yang *et al.,* [13] presented this algorithmic program could be a choice method of optimizing master cluster-head and assistant cluster-head by introducing assistant cluster-head within the cluster and artificial bee colony algorithm.

Shaleen Shukla *et al.,* [14] proposed the huge knowledge may be a great deal of knowledge that is tough to handle by obtainable systems. As knowledge will increase as per volume, dark knowledge additionally can increase. In huge knowledge, there's a distributed setting thus needed sources are also in several places. Throughout the method of {the knowledge |the info| the information}, these data sources got to establish from completely different places and analyze one system. This requires calculation which might facilitate the North American nation to seek out the most effective choice for our needed knowledge sources. It will be used for giant knowledge for distinguishing knowledge resources.

Xiangyu Yu *et al.,* [15] suggested by modifying the change equation of the viewer bee and scout bee of the original artificial bee colony algorithmic program, a detector preparation algorithmic program supported the changed ABCs algorithmic program is planned.

Saikat Chakraborty *et al.,* [16] presented the swarm intelligence has well-tried its importance for the answer to these issues that can't be simply prohibited classical mathematical techniques. Artificial bee colony algorithmic rule may be a simulation of honey bee hunting behavior, established by Karaboga in 2005.

S.S. Aravinth *et al.,* [17] proposed the matter of exposure, which is related to the standard of coverage, which may be a basic issue sweet-faced in wireless sensing element networks. Rummage around for the Minimum Exposure Path is one of the crucial issues in Wireless sensing element Networks. The obtainable hybrid technique doesn't have adequate accuracy to induce the MEP, which is simply too difficult and isn't appropriate to networks having heterogeneous sensing element nodes, or in sizable amount, or associate degree all-sensor intensity operate. variety of experiments were doled out, additionally, the results show that the projected model additionally the} designed IABC will facilitate in increasing accuracy and may be helpful to not simply the heterogeneous sensing elements' case however also the state of affairs in wherever their square measure a giant variety of sensor nodes and also an all-sensor intensity operate.

Mirza Samiulla Beg *et al.,* [18] presented a compares various bees' algorithm with testing on optimization problems. The results of various algorithms shown that the algorithm proved to be effective to improve the search performance and advanced optimization problem.

Pei Yu He *et al.,* [19] suggested the characteristics of the best detector readying in theory, they tend to improve the quality artificial bee colony algorithmic rule by introducing the gap issue to boost the witness bees choice chance formula, dynamic the operating mode of the scout bee to avoid worse coverage rate and dynamic the limit l for scout bee to extend the possibility to induce higher resolution. Results show that the improved artificial bee colony algorithmic rule has quicker focused speed and better coverage rate compared with the quality artificial bee colony algorithmic rule.

S. Sivakumar [20] presented the most plan of localization is that some deployed nodes with best-known coordinates termed as anchor nodes transmit beacons with their coordinates to assist the opposite nodes within the sensing field to localize themselves. During this paper, the projected

optimization approach is the Artificial Bee Colony formula that is incorporated with MAP-M&N to additional improves the accuracy in positioning the sensing element nodes.

Satvir Singh *et al.,* [21] proposed the wireless communication has determined mammoth advancement since the start of this century. This work thought-about a way to optimally confirm locations of Base Transceiver Station, such a minimum range of BTS is put in to hide a bigger range of subscribers at lesser infrastructural value. These EAs are wont to acquire near-optimal solutions for NP-Hard discretional optimization issues.

Ajit Kumar *et al.,* [22] presented a knowledge cluster as a crucial data processing technique being widely utilized in various applications. This paper provides a literature survey on the alphabet, its variants, and its applications in the knowledge cluster.

ManDing *et al.,* [23] proposed a unique artificial bee colony formula with a dynamic population, which synergizes the thought of associate degree extended life-cycle evolving model to balance the exploration and exploitation trade-off. ABC-DP has then used for resolution the best power flow downside in power a system that considers the value, loss, and emission impacts because of the objective functions.

Masataka Kojima *et al.,* [24] presented an Artificial Bee Colony that could be a quick and strong algorithmic rule to resolve varied optimization issues with complicated nonlinearity. Especially, the first rudiment is effective for top dimensional issues, compared with the opposite metaheuristic algorithms. Recently, improved first rudiment strategies for determining dynamic optimization issues are projected. However, it's troublesome for these strategies to balance the pliability to temporal changes of environments and also the focusing speed to solutions. The projected technique will understand quick answer seek for varied dynamic optimization issues, suppressing excessive convergence to restricted solutions.

Faten Hamad *et al.,* [25] presented programming testing as a critical stage in the programming advancement lifecycle. There are various kinds of' basic programming testing philosophies that might be commonly used and pushed ahead through improving the navigate of the entirety of the possible code programming ways. They propose a programmed test information age approach that utilization artificial bee colony algorithm calculation for programming basic testing, especially, way testing. This is welcomed on moving the centralization of information age testing, rather than the computerization of the entire testing activity. It executes artificial bee colony algorithm calculation by making testing information for the standards of way inclusion testing and afterward applying the system to a gathering of test programs.

Yan *et al.,* [26] proposed a 'dynamic' artificial bee colony algorithm calculation for tackling enhancing issues. A dynamic 'action' factor is acquainted with D-ABC calculation to accelerate intermingling and improve the nature of the arrangement. Boundary advancement is huge to improve the grouping execution of SVM-based classifiers. Characterization precision is characterized as the complaint work, and the numerous boundaries, including 'part boundary', 'cost factor', and so on, structure an answer vector to be advanced.

R. Salem *et al.,* [27] suggested that distributed computing is a cutting-edge innovation for managing the enormous scope of information. The Cloud has been utilized to handle the choice and situation of replications for a huge scope. The Artificial Bee Colony is an individual from the group of the multitude of knowledge-based calculations. It recreates honey bee heading to the last course and has been demonstrated to be viable for improvement. ABC has been utilized to illuminate most brief courses and cheaper issues to distinguish the best choice for replication arrangement, as indicated by the separation or briefest courses and lower costs that the rucksack approach has used to take care of these issues. Multi-target advancement with the artificial bee colony algorithm calculation can be utilized to accomplish the most noteworthy proficiency and least expenses in the proposed framework.

Doğan Aydin *et al.,* [28] proposed the Steady Artificial Bee Colony algorithm with Local Search is one of the productive variations of artificial bee colony algorithm province improvement which was effectively applied to financial force dispatch issues previously. In this investigation, they presented another algorithm to be specific Artificial Bee Colony with Dynamic Population size which is utilizing comparative instruments characterized in IABC-LS without utilizing numerous boundaries to be tuned. For reasonable examination, the boundaries of both IABC and ABCDP calculations are resolved using a programmed boundary arrangement instrument, Iterated F-Race. IEEE 30 transport test framework and 40-generator units issue are utilized as the difficult occurrences.

H. Suyono *et al.,* [29] presented it might cause a voltage drop and other effects identified with power misfortunes as a result of the restricted accessibility of receptive influence sources in the framework. Consequently, execution of pay gadgets, for example, capacitor bank, Static VAR Compensator, and other Flexible AC Transmission System gadgets to infuse responsive capacity to the organization are required. They present two improvement draws near, including both deterministic and nondeterministic strategies. Examination of the voltage profile and force misfortunes without and with an infusion of SVC of the influence framework has been controlled by utilizing the ABC calculation enhancement strategy. Given the investigation results, it was realized that the SVC improvement could support the voltage profile at all transports viable to the worth higher than its base permitted voltage.

Celal Ozturk *et al.,* [30] proposed one of the most notable double forms of the artificial bee colony algorithm is the similitude measure-based discrete artificial bee colony, which was first proposed to manage the uncapacitated office area issue. Although it is acknowledged as one of the basic, novel, and effective parallel variations of the artificial bee colony algorithm, the applied instrument for creating new arrangements worried to the data of closeness between the arrangements just consider one similitude case for example it doesn't deal with all similitude cases. Besides, the prevalence of the proposed calculation is exhibited by contrasting it and the essential discrete artificial bee colony province, twofold molecule swarm improvement, the hereditary calculation in the unique grouping, in which the quantity of bunches is resolved naturally for example it shouldn't be indicated as opposed to the traditional procedures.

Shams K. Nseef *et al.,* [31] presented the interest in tackling true issues that change throughout the time, purported dynamic improvement issues, has become because of their commonsense applications. A DOP requires a streamlining calculation that can powerfully adjust to changes and a few procedures have been coordinated with populace-based calculations to address these issues. They propose a versatile multi-populace artificial bee colony algorithm for DOPs. ABC is a straightforward, yet effective, the nature-propelled calculation for tending to mathematical advancement, which has been effectively utilized for handling other streamlining issues. The proposed ABC algorithm has the accompanying highlights. Contrasted with best-in-class techniques, our proposed ABC algorithm delivers excellent outcomes.

CelalÖztürk *et al.,* [32] presented the utilization and advancement of remote sensor networks build, issues identified with these organizations are being found. An artificial bee colony algorithm is applied to the dynamic organization of versatile sensor organizations to increase better execution by attempting to expand the inclusion region of the organization.

Karaboga D. *et al.,* [33] suggested the numerous tale designs, conventions, calculations, and applications have been proposed and actualized. The effectiveness of these organizations is exceptionally reliant on steering conventions straightforwardly influencing the organization's lifetime. Bunching is one of the most well-known methods favored in steering tasks. The aftereffects of the trials show that the artificial bee colony algorithm-based grouping can effectively be applied to WSN directing conventions.

Adi Srikanth *et al.,* [34] presented the software testing is one of the vital pieces of the programming advancement lifecycle. Utilizing this as a limitation, software testing is acted in a way that requires decreasing the testing exertion yet ought to give excellent programming that can yield practically identical outcomes. Given the astute conduct of the bumblebee, this technique creates an ideal number of experiments to be executed on programming under test.

S. Vijayashree *et al.,* [35] suggested the group head political decision depends on the remaining energy of the hub. Reproduction results show that in correlation with different calculations such as Random walk and Ant Colony Optimization, the proposed algorithm can viably lessen information transmission, spare energy, improve network information assortment proficiency and dependability, and expand the organization's lifetime.

Syed Fawad Hussain *et al.,* [36] proposed an Artificial Bee Colony enhancement-based calculation for co-bunching of high-dimensional information. The ABC calculation is utilized for advancement issues including information bunching. They consolidate parts of co-bunching by implanting it into the target work utilized for grouping by the ABC calculation. This measure utilizes co-advancing similitudes which when installed into the target work brings about upgrading the co-bunches.

Ilango, S.S *et al.,* [37] presented one of the serious issues is that the time taken for executing the conventional calculation is bigger and that it is exceptionally hard for handling enormous measures of information. The dataset size is shifted for the calculation and is planned with suitable timings. The outcome is noticed for different wellness and likelihood esteem which is acquired from the utilized and the passerby period of ABC algorithm from which the further adjustments of order mistake rate is finished. The proposed ABC Algorithm is actualized in the Hadoop climate utilizing mapper and reducer programming.

Beyza Görkemli *et al.,* [38] proposed the prominence of WSNs builds, issues identified with these organizations are being figured out. The dynamic arrangement issue is one of the principal challenges that directly affect the presentation of WSNs. A novel advancement procedure named the brisk artificial bee colony algorithm was applied to the dynamic sending issue of WSNs. Moreover, some CPU time investigations were accommodated qABC and ABC thinking about various elements of the issue. Reproduction results show that the qABC algorithm is a successful strategy that can be utilized for the dynamic organization issue of WSNs, and it by and large improves the intermingling execution of the standard ABC on this issue when r1r1

Famila S. *et al.,* [39] suggested the ideal choice of Cluster Heads, they propose an Improved Artificial Bee Colony streamlining based Clustering calculation by using the benefits of the Grenade Explosion Method and Cauchy Operator. This joining of GEM and Cauchy administrator forestalls the Artificial Bee Colony algorithm from stuck into neighborhood optima and improves the union rate.

Y. Lu *et al.,* [40] proposed a versatile sink-based way enhancement technique in WSNs utilizing an artificial bee colony algorithm is proposed. Second, an improved artificial bee colony algorithm is proposed to tackle the issue. From one viewpoint, the combined factor is

acquainted with the position update of the utilized honey bee stage to accelerate the union of the calculation. Then again, the Cauchy change administrator is introduced to expand the variety of the practical arrangement and upgrade the worldwide inquiry capacity of the calculation. The reproduction results show that the proposed algorithm is superior to the customary techniques in the parts of energy proficiency and the constant exhibition of information assortment.

Ren, G. *et al.,* [41] suggested the time spent information assortment, how to amplify the information, the briefest portable way, and the unwavering quality of the organization is an advancement issue. To tackle the above issues propose an algorithm of dependable information assortment for versatile Sink dependent on improved artificial bee colony algorithm. It consolidates the determination of bunch hub, the transmission way from sensor hub to group hub, and the way advancement of portable Sink. It gives a regular model arrangement of information assortment in MWSNs, remembering the strategy for network energy utilization for the cycle of information assortment. By the improved artificial bee colony algorithm, it gets the most limited way arranging of versatile Sink for looking through each bunch hub. The sensor hub sends information to the closest bunch hub by multi-bounce directing with briefly sparing, and afterward, it is shipped off the versatile Sink. The proposed algorithm can viably lessen the measure of sensor hubs communicated to portable sink with improving the productivity of information assortment. Contrasted and different techniques, can decrease network energy utilization and increment energy utilization equilibrium and organization dependability, to delay network lifetime.

Raj P.V.P *et al.,* [42] presented an ideal execution and improved lifetime are the best plan benchmarks for WSNs and the component for information gathering is a significant constituent affecting these norms. Particularly in delay-inescapable applications, it is trying to choose the best-stops or meeting focuses for MS and to plan an effective course for MS to accumulate information. To give a reasonable answer to these difficulties, they propose, a game hypothesis and upgraded insect state-based MS course choice and information gathering procedure. GTAC-DG assists with decreasing information move and the executives, energy utilization, and deferral in information conveyance. The MS moves in a solid and shrewd direction, broadening the lifetime and saving the energy of WSN.

Amin Shahraki *et al.,* [43] suggested WSNs are viewed as profoundly adaptable specially appointed organizations, network the executives have been an essential test in these sorts of organizations given the sending size and the related quality concerns, for example, asset the board, versatility, and dependability. Geography the board is viewed as a suitable procedure to address these worries. Bunching is the most notable geography of the executive's strategy in WSNs, gathering hubs to oversee them and additionally executing different errands in a conveyed way, for example, asset the board.

Kim SS. *et al.,* [44] proposed a novel cognitively inspired artificial bee colony bunching calculation with a grouping assessment model to deal with the energy utilization in intellectual remote sensor organizations.

Ms. A. Mahalakshmi *et al.,* [45] suggested the information gathering is a significant concern whereas to upgrade the organization's lifetime. They proposed, Energy-Efficient Data Gathering Scheme is acquainted with giving a balance between information assortment and energy the board among sensor hubs. Hand-off hubs are situated close to the anchor hub to gather the information successfully. Information gathering calculation gives the method to accomplish more information assortment rate by embracing a non-fundamental hub in the bunched area.

S. Gopikrishnana *et al.,* [46] presented the courses are picked dependent on the briefest reaction time for the telecom solicitation to limit the all-out energy exhausted by the organization. They propose a high secure lopsided key cryptography calculation to give safe information correspondence among the organization. The information total capacity that is utilized in the proposed directing calculation upgrades the lifetime of the sensor network by settling the deferral, crash, and security issues. Reproductions results show that the paired tree-based information collection can considerably decrease the absolute energy utilization and resolves the most extreme information accumulation issues in remote sensor organizations.

Muhammad Arshad *et al.,* [47] presented in light of the ongoing advances in the region of remote systems administration, figuring, and capacity gadgets, Wireless Sensor Networks has arisen as a developing and future-empowered innovation in late many years. The goal of the exploration work is to configure, break down, and assess the presence of A Three-Tier Cluster-Based Routing Protocol for Mobile Wireless Sensor Networks. Directing conventions in these organizations go about as middleware, which is liable for upgrading the organization execution with less energy utilization and the group-based steering convention is a gigantic answer for improving the hub's energy effectiveness and dependability of information toward the base station. Besides, the reproduction results demonstrated that the proposed convention accomplishes better organization lifetime and information dependability as well as diminished energy dissemination of the sensor hubs when contrasted and noticeable WSN bunch-based directing conventions. The proposed convention has been considerably material in a broad assortment of ecological and common observation applications.

M. Vahabi *et al.,* [48] proposed the Industrial Internet of Things can be executed in plants and gracefully affixes to improve fabricating proficiency. Adding information

assortment ability to the portable robots would understand the versatile sink sending in future plants. They propose logically model a given direction for the movement of portable sinks and the steering of versatile sinks along the direction in an IIoT framework.

Singh, Palvinder *et al.,* [49] presented the Computational Intelligence based metaheuristic like Ant Colony Optimization, Particle Swarm Optimization, Genetic Algorithm, and all the more as of late, Artificial Bee Colony, have VII-VIII been utilized broadly as populace-based improvement procedures for planning energy-proficient directing conventions in WSNs. In this examination work, an energy-proficient various leveled directing convention Bee Swarm is introduced which depends on nature propelled improved Artificial Bee Colony metaheuristic. The proposed convention is broadly assessed with other existing notable steering conventions on Nature Inspired Tool for Sensor Simulation, a reproduction apparatus extraordinarily created to assess directing conventions for WSNs with various situations. Recreation results demonstrate that Bee Swarm beats other existing directing conventions over different execution metrics and set up it as a superior energy-effective steering convention among its friends in any event, for versatile WSNs.

A. Rodriguez *et al.,* [50] proposed the remote sensor networks are utilized for a few business and military applications, by gathering, handling, and dispersing a wide scope of information. Amplifying the battery life of WSNs is urgent in improving the presentation of WSN.

Yinggao Yue *et al.,* [51] presented the information assortment is a key activity in different versatile remote sensor network applications. Customary information assortment strategies just spotlight on expanding the sum information assortment or decreasing the general organization energy utilization, which is the reason they planned the proposed heuristic calculation to mutually consider bunch head choice, the steering way from standard hubs to the group head hub, and portable Sink way arranging improvement. The proposed information assortment calculation for versatile Sinks is, as a result, in light of counterfeit honey bee province. Reenactment results show that in examination with different calculations, the proposed calculation can adequately lessen information transmission, spare energy, improve network information assortment proficiency and unwavering quality, and broaden the organization's lifetime.

Ankit Gambhir *et al.,* [52] suggested the most primary concern in remote sensor networks is the executives of the energy of the little hubs sent for detecting physical or natural states of a territory. ABCO based LEACH calculation is tried extensively on different situations of WSNs, changing the greatest number of rounds just as the number of sensor hubs. Various quantities of boundaries, for example, dead hubs per round, alive hubs per round, and parcel to base station per round, are taken into worry for execution assessment.

S. Arun Kumar *et al.,* [53] proposed the executives of energy are a significant test for cell phones, having the organization movement as often as possible taking up an extensive piece of the energy in the general framework. The mechanical cell phones in the ongoing occasions are fitted with a few remote organization interfaces, these gadgets work with less battery power. An energy-compelling Adaptive Wireless Network Interface Selection with Artificial Bee Colony is proposed. AWNIS-ABC algorithm picks the best of the remote organization interface concerning the energy devoured by taking the QoS of the connection into thought just as following a howdy speed network interface-choice stretch dependent on the situation in the organization. Various remote organization interfaces in cell phones are used in improving the energy effectiveness, the fulfillment of QoS happening during information move. The reenactment of the organization is executed through Network Simulator 2.

Famila S. *et al.,* [54] suggested the central goal of controlling geography, monitoring energy, and broadening the existence cycle in sensor networks is profoundly crucial for boosting its lifetime. Meta-heuristic streamlining calculations are discovered to be ideal in encouraging the cycle of bunch head political race and grouping. The capability of Grenade Explosion and Cauchy administrator are inserted in the Onlooker Bee and scout honey bee stage for incredible improvement in the level of abuse and investigation of looking through that guides in the ideal appointment of bunch heads. The reenactment aftereffects of IABCOCT demonstrate that the death pace of sensor hubs is limited for improving organization lifetime

Hashim A. Hashim *et al.,* [55] presented the conveying sensor as a hub haphazardly more often than not creates introductory correspondence opening even in profoundly thick organizations. In one or the other case, the subsequent between hub separations may debase the exhibition of the organization. The ABC-based arrangement is ensured to broaden the lifetime by upgrading the organization boundaries and obliging the all-out number of conveyed transfers. Recreations approve the adequacy of the proposed methodology under various instances of issue unpredictability.

T. R. Kulkarni *et al.,* [56] presented the limitation challenge as been acted like a multidimensional worldwide improvement issue in prior writing. Many multitudes of insight calculations have been proposed for precise restriction. Aftereffects of MATLAB reenactment of ABC-based multistage confinement have been introduced. Further, the outcomes are contrasted and those of the restriction technique dependent on the molecule swarm enhancement calculation. A correlation of the exhibitions of ABC and PSO calculations has been introduced regarding the number of hubs confined, limitation exactness, and the calculation time. These outcomes in a compromise among speed and precision of limitation in WSNs.

R. Chen *et al.,* [57] suggested loads of investigates have investigated how to expand the lifetime of remote sensor organizations. They will utilize an artificial bee colony algorithm and additionally select calculation to design a transmission course of the recognized highlights. Watch hubs will gather detecting information of close by sensor hubs, identifying designs in the assortment information to affirm the assortment information if is typical.

Yang Yang *et al.,* [58] proposed the algorithm as a choice cycle of enhancing ace group head and colleague bunch head by presenting right-hand bunch head in the bunch and artificial bee colony algorithm.

W. Zheng *et al.,* [59] presented each food source speaks to potential and achievable up-and-comer way between every unique and objective hub. The places of food sources are altered by some fake honey bees in the populace to find the spots of food sources. The food source with the most noteworthy nectar esteem is by all accounts an answer which is assessed by the wellness work.

X. Hai-Bin Duan *et al.,* [60] suggested a novel crossover Artificial Bee Colony and Quantum Evolutionary Algorithm is proposed for taking care of nonstop improvement issues. The exploratory correlation results exhibit that the proposed crossover ABC and QEA approach is doable and successful in tackling complex constant advancement issues.

Y. ManitaDangi *et al.,* [61] presented it burns-through energy to communicate, to advance, and to get the information over the organization. Organization lifetimes rely upon the energy level of hubs, rely upon handling the intensity of hub, memory, and transmitter power. They propose fundamental concentration to keep up the greatest life of the organization, during information transmission in a proficient way.

Z. Singh Amit *et al.,* [62] proposed the objective of this work is to improve throughput by utilizing the smart method, which may give relatively better streamlining. They present an organically motivated coding approach called Artificial Bee Colony Network Coding, an alteration in the COPE structure. They propose ABC-NC over the current COPE system for the remote climate.

Mr. Shaleen Shukla *et al.,* [63] presented a piece of information that is difficult to deal with by available frameworks. As information increments according to volume, dim information additionally will increment. In Big Data there is a disseminated climate so required sources might be in better places. During measure the information these information sources need to discover from better places and investigate one framework. This requires computation that can assist us with discovering the most ideal alternative for our necessary information sources. It very well may be utilized for Big Data for distinguishing information assets.

Shilpa R. Litake *et al.,* [64] suggested the capacity to choose the ideal access network out of accessible access networks chooses the thorough presentation of the framework. The goal of the proposed work is to pick the most encouraging access network out of accessible existing together organizations for improving client experience. Fluffy rationale gives dependable outcomes in any event when the information boundaries are irregular and cannot be characterized definitely.

The proposed framework consolidates the best of the fluffy rationale and ABC calculation for the ideal inception of vertical handover. To accumulate the necessary data for handover, administrations gave by IEEE 802.21 standard are used. The proposed combination of the fluffy rationale and the ABC calculation has brought about a diminishing number of superfluous handovers. The improvement of an objective access network determination measure is accomplished utilizing the meta-heuristic technique.

Chunming Wu *et al.,* [65] proposed to improve the horrible showing of LEACH convention in energy utilization, and improved calculation dependent on ABC algorithm is proposed. Through the presentation of information combination, propose a WSN Routing Protocol, and model the cycle of the fake province calculation improved LEACH convention bunch head political race. The reenactment results show that contrasted with and customary LEACH convention, this calculation can adequately adjust the heap of organization, decline the energy utilization of hubs, lessen network traffic by about 10%, and improve network lifetime by 33.83%.

R. Eswaramoorthi *et al.,* [66] presented the multitude of insight improvement approach has been conveyed to encourage recurrence counterbalance enhancement. An improved artificial bee colony algorithm-based advancement approach is proposed in this work that will empower ultra-wideband symmetrical recurrence division multiplexing framework, which will at that point be sent in the transporter recurrence counterbalance joint assessment and for inspecting recurrence balance.

By appropriate choice of cyclic defer times, connection existing between adjoining sub transporters, a joint assessment of both CFO and SFO has been determined by utilizing IABC. The presentation of the proposed calculation is contrasted and the current assessors and this examination is done by MATLAB7.2 reenactment, which unmistakably portrays that the exhibition of the proposed calculation is predominant as far as assessment exactness.

He *et al.,* [67] proposed the attributes of the ideal sensor organization in principle, they improve the standard artificial bee colony algorithm by acquainting the separation factor with improving the spectator honey bees determination likelihood equation, changing the working method of the scout honey bee to maintain a strategic distance from more regrettable inclusion rate and changing

the cutoff l for scout honey bee to expand the opportunity to improve the arrangement. Results show that the improved artificial bee colony algorithm has a quicker focalized speed and higher inclusion rate contrasted and the standard artificial bee colony algorithm.

Xiangyu Yu *et al.,* [68] suggested by altering the refreshing condition of the passerby honey bee and scout honey bee of unique artificial bee colony algorithm, a sensor arrangement calculation dependent on the changed ABC calculation is proposed.

A. A. Chang WL. *et al.,* [69] presented to limit the energy utilization on the going of the portable robot, it is critical to design an information assortment way with the base length to finish the information assortment task.

X. Zhang *et al.,* [70] proposed the associations of different sensors and gadgets in the IoT bring about a huge utilization of energy. Thusly, research on energy sparing and energy proficient strategies is basic. For remote sensors in an IoT network, supportable activity in an energy-productive way is fundamental because of the restricted battery limit of sensors. They endeavor to examine an IoT network containing remote sensors and base stations. To spare electrical energy, the information moves of the talked about IoT network situation is communicated as a minimization issue. Mathematical recreations show that energy utilization in the examined network situation can be limited utilizing the proposed strategy with a decent, strong property.

R. Teja *et al.,* [71] presented the Remote Sensor Networks are restricted by the battery life of the sensor hubs just as doors and ought to have the option to send helpful parcels to the Sink. Consequently, energy productivity and information bundles are the essential boundaries that must be thought of while planning to bunch and directing calculations for WSN. They present an energy-productive just as a need-based remote sensor network grouping and steering calculation for a numerous sink situation utilizing Artificial Bee Colony Optimization with a multi-target wellness work which considers the need of each sink, energy of entryway, sensor, and separation of sensor hub to the door which decreases the energy utilization of the organization and guarantees the sinks with greater need get more parcels.

P. Visu *et al.,* [72] presented the Adhoc network is a major basic issue that wants the presentation of remote organizations. Consequently, the steering convention in remote climate requires numerous extra contemplations, for example, ideal energy the board, grouping, giving blockage free correspondence, offering versatility, keeping up the Quality of Service. Furthermore, the equivalent is likewise separated as Traditional, Flat, Hybrid, and Hierarchical directing conventions. The proposed energy effective directing conventions utilizing Artificial Bee Colony-based steering calculation.

Mann, P.S *et al.,* [73] proposed the multitude of insight-based metaheuristics are very much applied to tackle constant streamlining issues of proficient hub bunching and energy-mindful information steering in remote sensor organizations.

SelcukOkdem*et al.,* [74] presented the exhibition of the Artificial Bee Colony Algorithm on directing activities in WSNs is considered. The acquired execution result shows that the pre-owned convention gives a longer organization lifetime by sparing more energy.

M. A. Zangeneh *et al.,* [75] suggested that a predetermined number of assets in Wireless sensor Networks and long correspondence separation among sensors and base station causes high energy utilization and thus lessens the organization lifetime. Consequently, one of the significant boundaries in these organizations is streamlined energy utilization. One approach to decrease energy utilization is to bunch the organization.

Ahmad T *et al.,* [76] proposed the choice of CH is an extremely testing assignment, and it influences the energy utilization of the organization and the lifetime of sensors and at last organization's lifetime. This part presents another methodology for CH determination dependent on Artificial Bee Colony enhancement. This ABC enhancement depends on the excess energy, intra-bunch separation, and good ways from the sink station. They streamlined the wellness work utilizing ABC improvement. The target of enhancing the wellness work is to choose an ideal CH for each group which decreases the energy utilization of the WSN.

Chong–Huan Xu *et al.,* [77] presented the attributable to the hugeness and failure to remember the qualities of the information stream, the proposed approach utilizes a damped window model to segment them. At that point, it receives adjusted K–implies dependent on the Artificial Bee Colony calculation to bunch this information stream part and progressively updates the grouping result.

Roselin, J *et al.,* [78] presented the sticks to Quality-of-Service measurements, for example, inclusion, leftover energy, and lifetime. The reproduction results showed the adequacy of the leftover energy and inclusion in improving the organization's lifetime.

Karaboga, D *et al.,* [79] proposed a particularly two methodologies dependent on insect province and fish tutoring/winged creature running presented have profoundly pulled in light of a legitimate concern for specialists. Although the self-association highlights are needed by SI are unequivocally and unmistakably found in bumblebee states, sadly the scientists have as of late began to be keen on the conduct of these multitude frameworks to portray new savvy draws near, particularly from the earliest starting point of the 2000s. Step by step the number of scientists being keen on ABC calculation increments quickly.

Kim, SS *et al.*, [80] presented a novel intellectually enlivened counterfeit honey bee province bunching calculation with a grouping assessment model to deal with the energy utilization in psychological remote sensor organizations. The ABCC algorithm can ideally line up with the elements of the sensor hubs and group heads in CWSNs. Reproduction results show that the ABCC algorithm beats molecule swarm advancement, bunch inquiry enhancement, low-energy versatile grouping chain of command, LEACH-brought together, and crossover energy-productive disseminated grouping for energy the board in CWSNs. The proposed algorithm is progressively better than these different methodologies as the number of hubs in the organization develops.

IV. OBJECTIVES OF THE STUDY

The main objective is to explore resource allocation strategies in data optimization using ABC algorithm with dynamic technique for improving network performance in wireless communication for optimal utilization of resources to minimize cost, time and energy consumption and maximize trust, and reliability.

1. To develop a better performance of clustering on the large volume of unsupervised data for smooth access.
2. To reduce data access time by minimizing the execution steps.
3. To reduce energy consumption with better trust and reliability.

V. HYPOTHESES OF THE STUDY

In the field of optimization, there are lots of algorithms to solve many problems but require solving other problems like better performance to reduce data access time and also reduce energy consumption. To solve this problem propose an algorithm namely data optimization using ABC algorithm with dynamic technique for improving network performance in wireless communication. In this algorithm, apply the dynamic technique in place of the greedy selection process in the ABC algorithm. Apply the dynamic technique for selecting new node. Dynamic technique gives the guarantee for optimal solutions whereas greedy technique does not give the guarantee for the optimal solution. Dynamic technique uses the concept of memorization whereas greedy technique does not use the concept of memorization.

VI. PROPOSED METHODOLOGY

This proposed algorithm uses the dynamic techniques in place of the greedy selection process in the ABC algorithm. So, improving network performance in wireless communication algorithm for better exploitation, better performance of clustering on a large volume of unsupervised data for smooth access, reduce data access time by minimizing the execution steps and reduce the energy consumption with better trust and reliability.

The proposed method is as follow

1. Firstly, collect the data and aggregate it and transfer it to the sink node.
2. Apply the ABC algorithm at the base station.
3. Apply dynamic technique for selecting a new node. This technique applies employee bee and onlooker bee.
4. The proposed methodology will be used at least 50 wireless sensors.
5. After successful implementation on 50 wireless sensors will be implemented on 100 and 200 wireless sensors.

VII. ARTIFICIAL BEE COLONY (ABC) ALGORITHM

Honey bee swarms consist of three essential components: food sources, employed foragers and unemployed foragers, and two leading modes of the behavior, recruitment to a nectar source and abandonment of a source. A food source value depends on many factors, such as its proximity to the nest, richness or concentration of energy, and the ease of extracting this energy. The employed foragers are associated with particular food sources, which they are currently exploiting, or for which are employed. They carry with them information about these food sources and share this information with a certain probability. There are two types of unemployed foragers, scouts, and onlookers. Scouts search the environment surrounding the nest for new food sources, and onlookers wait in the nest and find a food source through the information shared by employed foragers (Shayeghi *et al.*, 2011).

In the ABC algorithm, the colony of artificial bees consists of three groups of bees: employed bees, onlookers, and scouts. A food source represents a possible solution to the problem to be optimized. The nectar amount of a food source corresponds to the quality of the solution represented by that food source. For every food source, there is only one employed bee. In other words, the number of employed bees is equal to the number of food sources around the hive. The employed bee whose food source has been abandoned by the bees becomes a scout. Bees search for food sources in a way that maximizes the ratio E/T, where E is the energy obtained, and T is the time spent for foraging. E is proportional to the nectar amount of food sources discovered by bees.

The main steps of the algorithm can be described as follows

Step 1: Initialization: Set the control parameter values. Make the first half of the colony consist of the employed bees and the second half includes the onlookers. Then randomly generate a position for each candidate and evaluate it. Set the current scout number s = 0.

Step 2: Introduce new food sources discovered by scouts: If s > UB, order the first half of the colony, make the bees with the worst solution quality as scouts, and others as employed bees. Update the scout numbers.

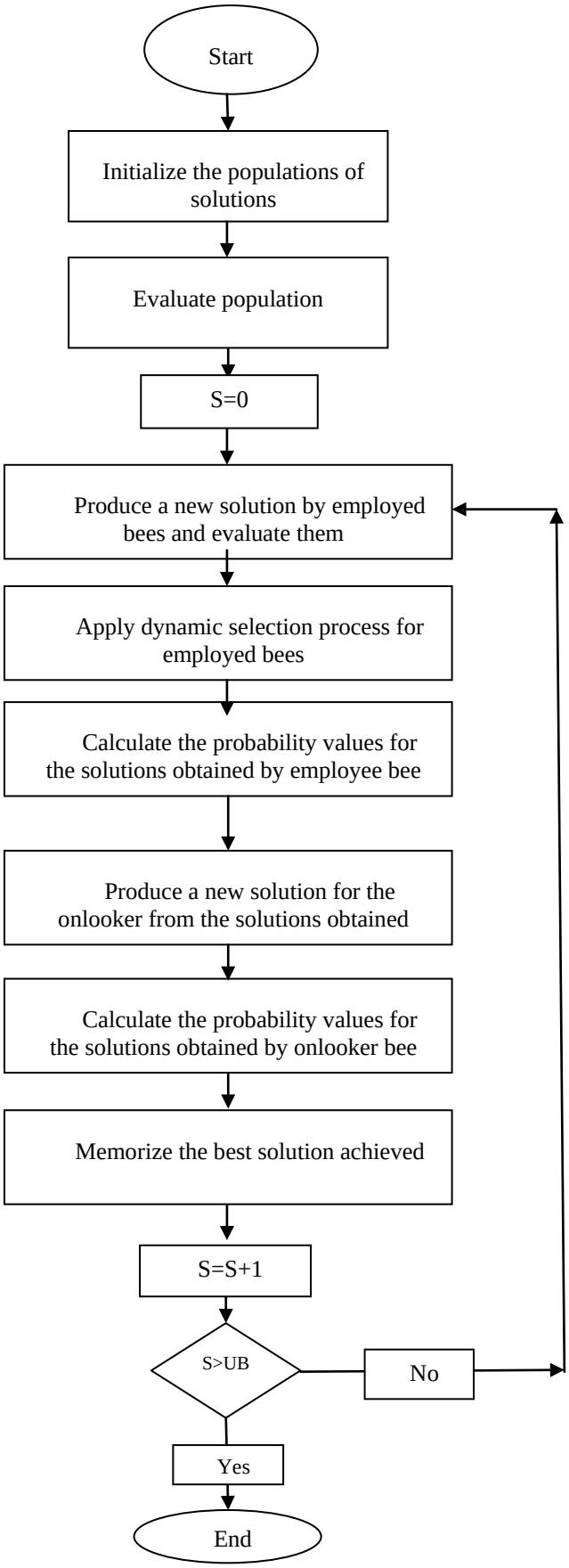

Fig. 1 Algorithm

Step 3: Employed bees exploitation: Produce a new solution for each employed bee and evaluate it. Then the dynamic selection process is applied. If the 'limit' for abandonment is reached, the employed bee forgets its memory and becomes a scout for exploration. The scouts number s = s + 1.

Step 4: Scouts exploration: Send each scout into the search area for discovering new food sources randomly. When a new food source is found, evaluate it, and the dynamic selection process is applied.

Step 5: Preferences computation for the current food sources: Calculate the probability values of the current food sources with which they are preferred by the onlookers.

Step 6: Onlooker's exploitation: For the onlookers, produce new solutions from the current food sources selected depending on the computed probabilities and evaluate them. Then the dynamic selection process is applied to update the corresponding employed bee's memory or the current food sources.

Step 7: Memorize the best position: For each employed bee and scout, if its memorized position is better than the previously achieved best position, then the best position is replaced by it.

Step 8: Check the termination criteria: If the termination condition is not satisfied, go to Step 2, otherwise, stop the algorithm.

After each candidate source position is produced and evaluated by the artificial bee, its performance is compared with that of its old one. If the new food has an equal or better nectar amount than the old one, it is replaced with the old one in the memory; otherwise, and the old one is retained in the memory. In other words, a dynamic selection mechanism is employed as the selection operation between the old and the candidate. Figure 1 shows a flowchart of the implementation of the ABC algorithm.

VIII. PROPOSED SCHEME

The proposed protocol named ERABC (Energy-aware Routing using Artificial Bee Colony) consists of three phases, namely cluster head selection, cluster formation, and data transmission. Cluster head selection and data transmission phases are performed by the ABC algorithm. The cluster head selection process is initiated by the base station. After the cluster heads are identified, clusters are formed based on the distance calculation. Once the cluster head and clusters are formed, the data can be transmitted on the established routing path. The data transmission phase consists of three phases, namely the initialization phase, employee-bee phase, and onlooker-bee phase.

A. Cluster Head Selection

In this phase, the number and selection of CHs are determined. Estimating the number of CHs is necessary before clustering the network especially for the randomly

distributed network or network with an irregular area. After determining how many clusters are proper for the network, the CHs are selected using the ABC algorithm by considering the factors of energy and distance to the base station to make the clusters stable and to prolong the network lifetime. This phase consists of the following steps.

Step 1: At this step, the initialization of the network is made when sensor nodes are deployed to the area. Also, the information about the nodes like their distance to the base station and energy status is gathered. The base station has obtained this information by receiving the advertisement message from each node in the network. Then the base station randomly selects k cluster heads among the n nodes in the network.

Step 2: The base station evaluates the fitness of the randomly selected cluster heads by the assignment of an employee bee to each cluster head. The employee bee calculates the fitness value of the selected cluster head.

Step 3: In the onlooker-bee phase, the probability value is defined to select the suitable cluster heads among the randomly selected cluster heads. The employee bees share the fitness information about the randomly selected cluster heads with onlooker bees. An onlooker bee evaluates the fitness information taken from all employed bees and chooses a cluster head with a probability related to its fitness value

B. Cluster Formation

After the selection process of cluster heads in a round, cluster heads broadcast their status to the other nodes in the network. Then each sensor node determines which cluster it wants to join by choosing the cluster head that requires the minimum energy consumption and distance between the nodes to the cluster head. For transmitting the data from one member node to sink, the data can be directly sent or data can be sent to the cluster heads and then to the sink. In this way, data traffic is considerably reduced. While transmitting the data from the member node to the cluster head and then to the sink, the energy consumption is also considerably reduced. The cluster formation includes the following steps.

Step 1: Calculate the distance d(ni, CHj) between each node ni and all cluster heads CHj.

Step 2: The average value for the distance between each node in the network and each selected cluster head is found.

Step 3: Nodes choose the cluster heads whose distance is less than the average value of the distances. If more than one node falls in this criterion, then choose the cluster head that has more residual energy. In this way, all the nodes in the network join their corresponding cluster heads.

To equalize the number of nodes in each cluster, a steady factor is used which allows only a limited number of nodes to act as its member. The node approaches a cluster head to join as its members form clusters. When the number of member nodes reaches above the steady factor, the node finds the next eligible cluster head. In this way, the clusters are formed. In this way of clustering, the energy-efficient clusters are formed, and the data are transmitted from a member node to the sink with minimum energy consumption.

C. Data Transmission

In a clustered approach, cluster heads gather data from sensor nodes and then aggregate this raw data to form the final abstract data. In aggregation, eliminate redundancies in the data obtained from different sensor nodes by performing simple processing (such as using max. or avg. operator) and minimize the total amount of data transmission before transferring data to the sink. Once the cluster head and clusters are formed, the routing path is established to transmit the packet from a sensor node to the sink using the foraging behavior of honey bees. It consists of the following phases

1. Initialization phase
2. Employee-bee phase
3. Onlooker-bee phase

D. Initialization Phase

The initialization phase consists of the following steps.

Step 1: The source node generates the packets and passes them to its corresponding cluster head (source CH).

Step 2: The initial set of n/2 nodes that are to be explored at the first level of the routing from the source CH are selected using the following equation.

Step 3: Also, the energy of each of the initially explored nodes (i.e. the initial energy of each of the nodes) is initialized.

Step 4: The position of the nodes in the network such as its location concerning the x-axis and the y-axis should also be maintained.

Step 5: The distance between the source CH and the initial level of explored nodes is calculated using the location.

E. Employee-Bee Phase

After the initialization phase, the nodes that are initially explored are given as input to the employee-bee phase. This phase consists of the following steps.

1. The fitness value of the explored nodes is calculated using Equation.
2. Now the nearby node of the initially explored node is selected using Equation.
3. The fitness value of the new node Vij is calculated using Equation.
4. The fitness values of the initial explored node Xij and the nearby node Vij are compared by applying the

dynamic selection process, and the node with the highest fitness value is selected.

4.1 If the neighbor node has the highest fitness value, then the neighbor node is added to the routing table, and the path between the current node and the neighbor node is discovered. Also, the energy, fitness, and distance of the neighbor node are updated.

4.2 If the current node has the highest fitness value, then the current node is retained, and the neighbor node is ignored.

5. The Steps from 2 to 4 are repeated for all the explored nodes in the initialization phase.

6. Hence the CHs that is retained at the end of the employee-bee phase is recorded.

F. Onlooker-Bee Phase

After the employee-bee phase, the CHs that is retained at the end give the input for the onlooker-bee phase. By getting this input, this phase will perform the following steps, the entire process is explained

Step 1: The probability of each of the employed bee CHs is calculated concerning the fitness value using Equation.

Step 2: The first exploration occurs to the CH with the maximum probability and the steps of the employee-bee phase are repeated.

Step 3: The rest of the (M/2)-1 CHs exploration is carried out by selecting the node with the maximum fitness value and the steps in the employee-bee phase are repeated.

Step 4: Thus, after these steps, the node with the greatest fitness value will reach the base station to deliver the packets.

Hence, the final path to the base station will be the best route with minimum energy consumption.

IX. DISCUSSION

The purpose of writing this paper is that having seen many papers, on which the technique has been used, there is a flaw in the technique that it always sees the minimum path. He does not see all the paths. Because of this, he does not give results accurately many times. Hence this deficiency can be overcome by using dynamic techniques. Therefore, this paper has been proposed. Due to which the results come to the precise percentage. Dynamic technology looks at all paths. Only then gives accurate results.

X. CONCLUSION

In this paper dynamic technique has been used in place of the Greedy technique. It has been observed that in the Greedy technique of technique there is no guarantee of accurate results and its result is not near accurate, whereas the dynamic technique gives the result of guarantee. Its result is a hundred percent accurate. Dynamic technology uses memorization. This stores the result. It gives the minimum path as a result of surveying various paths. Therefore, its result is a hundred percent accurate.

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