

Prediction Meeting Logic Through Swarm Artificial Intelligence**Subhita Menon**School of Computer Science & Engineering
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Abstract: Researchers have often been trying to improve human intelligence either by replacing them with machines or by strengthening human brains with alternate sources (Medicines etc). In the course of making discoveries or helping humans with intelligent machines, we have come so far that now the zeal to be more than approximate and be the apt and accurate has taken over. Swarm intelligence is a research area inspired from various species namely ants, bees, fishes etc. Artificial Swarm Intelligence enables population to think together inspired from optimization algorithm and that too synchronously at real time which help in predication with the accurate result .

Keywords:-Swarm Intellect, Artificial Swarm Intelligence, Feedback-loops, Human Swarm

Introduction

The recent advances in Swarm Intelligence have led to the emergence of a new era known as Artificial Swarm Intelligence in short, which consist of large number of optimized algorithm. This study resolves or predicts human unsolvable problems through nature inspired Swarm artificial intelligence. In the following study I will unravel the way researchers are looking forward to tackle, resolve or predict human unsolvable problems through nature inspired Swarm artificial intelligence. Swarm Lately researchers have experimented human swarming which an art is of bringing human brains together to predict, solve or help reaching decisions and the results of the study are exemplary. In this study Systems Allow humans swarm Function around each other synchronously at real to make predictions, and reach decisions by collectively exploring a decision-space and converging on desired solutions.

Literature Review

Most of the optimization techniques discussed in the literature survey are nature inspired metaheuristic optimization techniques which are evolving as better alternative options of traditional approaches for the optimization problems. The basic reason behind popularity of modern metaheuristic based stochastic optimization techniques is that they have been developed on the basis of natural (robust) systems for solving NP-hard optimization problems since they exhibit extremely diverse, dynamic, robust, complex and fascinating natural phenomenon. They always finds the near optimal solution in reasonable time, however, algorithmic convergence is problem dependent.

K.N. Krishnanand et al. illustrates how optimization of multimodal gets influenced through swarm intelligence and the local adaptive decision of algorithm is directly utilized to identify multiple best possible functions with Glow-worm swarm based optimization algorithm for multimodal functions with collective robotics applications. Numerous optima capture for

multiple function of multimodal test is been conducted with effective result by adapting the idea in chemical leaks and robotics. [1]

Monica Sood et al. in their research discuss the hybridization of particle swarm intelligence and optimizing the bee colony, with a new approach to look for the path that helps to provide the better and efficient outcome from previous approaches which recognizes obstacles by capturing a satellite picture while traveling on the route. PSO provide the way to identify the path and the bee colony will help us to overcome the obstacle while moving on the chosen path. A few of morphological elements are often used to reduce the impact of trees and shadows for shortest path identification. [2]

Rahul Dogra et al. in their research study of Glow-worm Swarm Optimization Technique explored the best possible way to tackle desired flow of power difficulty with reducing the cost of fuel and keeping generator and transformer power outputs with safe limits. Throughout this paper, the algorithm will divide each agent into multiple categories, display concurrent taxis to one another at multiple optima of multimodal functionality. This technique was investigated and discovered the empirical function which is fuel cost under the consideration and reduced the optimal values of distinct elements under numerous constraints. [3]

Monica Sood et al. in their research study explored the unidentified territories using the hybridization of the cuckoo and bat algorithm to determine the best route though providing the robotic mapping to external vehicles possible on the route. The characteristics of Bat Algorithm is mapped to retrieve the noiseless image efficiently from the given satellite image pool. Now the threshold value for the selected final image is synthesized by applying the search method used by cuckoo algorithm. The provided route on the maps will get updated dynamically using the Self-Localization method, which is then compared to adjacent pixels. The idea behind this study shows that even in a complex environment, the path can be optimized easily on the provided route. The results indicate that the solution suggested is efficient and oriented as it picked the candidate picture in the very first phase, which means the objective purpose is accomplished in no time. [4]

Rosenberg expresses the need of Human swarm by the advent of artificial swarm intelligence. The paper proves its idea through research over UNU platform where Novice have Outperform the Experts by accurately forecasting the lead winner of 2015 academy awards. Real time method for collective intelligence is a nature inspired characteristic commonly found among various and have always fascinated researchers with their accuracy and efficiency. Unlike other species humans are not gifted with such senses or intelligence, which attracted researchers to build a space where human brains can collectively reach decisions and UNU as platform has allowed such space for ASI. The main Characteristic highlighted in the study is the efficiency and accuracy of the ASI compared to existing polls. The ASI overshadows existing polls when compared in terms of execution time and resources used. [5]

Rosenberg et al. discuss and compares the predictive ability of Artificial Swarm Intelligence systems against large betting markets when forecasting sporting events. The platform used to prove the research is UNU which allows multiple participants and thus support in forming real-time “human swarms,” which leads to decisive inputs and thus help ASI reach

predictions and significantly amplify the accuracy while forecasting Highlighted characteristics in the paper are the Decisive outcome options which derive the intent of the Participants and by engaging the participant continuously by decisive outcomes like “Pick of the week” inform about Which team is going to win and by how much ratio is most capable of winning. Again, people involved do not cast separate votes but communicate their purpose over period continuously, converging as a process. [6]

Varinder Singh et al. demonstrates the idea that human swarm of average minds can outperform the human expert completely. The research also focuses on how conventional ASI helps derive accurate results over conventional polls. In contrast to poll results that gather data from entities in alienation, swarms allow members to negotiate in actual-time synchronization, adjust and adapt as choices appear before their eyes. Swarm participants do not convey fixed opinions, but constantly analyze and reevaluate their individual beliefs about the specific outcomes, evaluating their personal interest and desires. In parallel with all participants, the swarm recedes on solutions that constitute the group's will and because of the ability of biological swarming to allow teams to integrate their expertise and instincts in real time, swarming is likely to be of the long term benefit when groups make strategic decisions on subjects that may be important. accessed from many unique perspectives. The peculiar property in this paper is the knowledge derived from honeybees swarm technique, where the choice to select a new home site has to be assessed on a number of competing considerations. In fact, once honeybee swarms choose to have a new colony site, dozens of places are considered, each one is evaluated with six independent features. Honeybee swarms have been recorded most of the time as making nearly optimal decisions, despite of the given decision difficulty involved.[7]

Louis Rosenberg et al. highlights the Human Swarm amplifying the accuracy while predicting the financial market. Among several researches the ability of human swarm is tested in prediction and decision making unlike some of the other social species, the skill set of humans to form closed-loop systems that allow swarming in real time has not evolved. It's because we lack the subtle ties that other species use to create high-speed feedback loops between members. To meet this goal, ASI was established to allow human groups to communicate linearly from anywhere in the world as real-time swarms online. This paper exhibits very insightful pattern of ASI which is the ability to update the responses based on closed loop feedbacks between participants and this property allows swarms to work coherently and influence participant's decisions and thus help reaching highly accurate prediction. [8]

Thomas D.et al. exhibits insights related to ability of Swarm Intelligence in guiding and amplifying decisions making support among complex and multiple selection criteria. The theory of multilevel selection demonstrates that groups of species may achieve high levels of operational organization with selection of intergroup prevails over selection within groups. The major thrust of the study was to acknowledge the fact that Bees ensure all possible nests to be traversed once and final decision of relocation is actually influenced by swarm responses. The whole study is experimented by choosing 5 nests where bees each dance are analyzed and each dance is allocated to one of three categories: slow, lively and medium. We analyzed the video files of the first 10 animated dances and the first 10 slow dances performed in each trial to establish an objective behavioral factor consistent with our subjective evaluations of liveliness. [9]

It is evident from literature survey that exploration and exploitation are the key performance factors of an optimization algorithm. Development of more efficient optimization algorithm that can be used to overcome arbitrary NP hard problems for single or multiobjectives in even lesser time, still remains a vital challenge for researchers. Tentatively, hybridization of different algorithms need to be experiment and tested on real world applications. During literature survey, some preliminary experiment simulations were conducted that encouraged us towards more detailed investigations in domain of optimization algorithms

Conclusion

The whole plan of research have experimented human swarming which an art is of bringing human brains together to predict, solve or help reaching decisions and the results of the study are exemplary. In this plan Systems enable human swarm (groups) to work together synchronously at real to make predictions, and reach decisions by collectively exploring a decision-space and converging on desired solutions with the hybridization of different algorithms need to be experiment and tested on real world applications. During literature survey, some preliminary experiment simulations were conducted that encouraged us towards more detailed investigations in domain of optimization algorithms.

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