A Review on Hill Climbing Optimization Methodology

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Abstract. The activity of walking through hilly country for pleasure. He is an avid athlete and loves mountain walking. Mountaineering is a terrifying quest used for mathematical optimization problems in the field of artificial intelligence. Given a large input and a good horistic function, it tries to find a good enough solution to the problem. The mountaineering algorithm consists of three parts, where the global maximum or optimal solution cannot be reached: the local maximum, the ridge and the plateau. The trek is not complete or optimal, the time complex of O (∞) but the space complex of O (b). There is no special processing data system as mountaineering rejects old nodes. Trekking in the Alps or other high mountains. This is not an efficient method. This does not apply to problems where the value of the horticultural function suddenly decreases while the solution is in view. First-choice trekking enables balanced trekking by randomly creating heirs until something better than the current situation develops. Whenever this is a good strategy there are many (e.g., thousands) heirs in a state. So the first preferred mountain climbing is a special type Random mountain climbing. Description. This is a robust mountaineering algorithm. A person is initiated approximately. ... When the individual reaches a local optimal state a new solution is created approximately and mountaineering begins again. The best first search is a traversal technique, which checks which node is the most reliable and decides which node to visit next by checking it. To this end, it uses the appraisal function to determine travel. Climbing is used to describe traditional 'siege' techniques, where you will climb the mountain several times before being driven to the summit. Albinism, on the other hand, focuses on 'fast and light' climbs. Free climbing was created to describe any style of climbing that is not AIDS related. ... In free climbing, the climber moves the wall under their own force without the use of any special gear (except for the climbing shoes) to help them move upwards. Climbers can only survive for a short time in the 'death zone' at 8000 m and above, where there are numerous challenges. Deep cracks, avalanches, cliffs and snowflakes make the high form of trekking a very dangerous endeavor. Caldwell and George's son use headlamps to illuminate their way, climbing at night when the temperature is cold - meaning their hands sweat less and there is more friction between their rubber shoes and granite. According to the author, climbing mountains is a very difficult task for people and they enjoy crossing obstacles. Mountaineering is neither complete nor optimal, the time complex of O (∞) but the space complex of O (b). There is no special processing data system as mountaineering rejects old nodes.
Keywords: Optimization, Hill-Climbing, Met heuristics

1. Introduction

Mountaineering can be very useful in routing related problems such as travel vendor problem, work planning, chip designing and portfolio management. This is good for solving the optimization problem when using only limited computational power. The downside of greed being the best first search is that it can get caught in loops. This is not optimal. The algorithm is a search engine that searches for the short path between the initial and final stages. This is in a variety of applications such as maps Used. In maps the A * algorithm is used to calculate the short distance between the source (initial stage) and the target, and the main problem with trekking techniques is the tendency to get entangled in foothills, plateaus or ridges. If the algorithm meets any of the above conditions, the algorithm will fail to find a solution. Mountaineering technique is mainly used to solve computationally difficult problems. It only looks at the current situation and the immediate future situation. Therefore, this technique is memory efficient as it does not maintain a search tree. At Gradient Descent, look at the slope of your local neighbor and head in a direction with a steep slope. 2. Mountaineering is less effective than gradient descent. ... Gradient Descent ensures you improve continuous operation and can calculate its slope at a given position. Finally, when choosing the first environment where trekking is better than the current situation, BFS checks more neighbors and compares them to horistic activity. This makes it possible to choose the best one in many states. Recursive Best-First Search or RBFS is an artificial intelligence algorithm that belongs to the Horistic Search Algorithm. It widens the border edges at the best first row. ... RBFS explores search space as a tree. The picture shows an example of a search location with a cost equal to the depth. How does random mountaineering select the next move each time? It generates a random move from the move set and accepts this move. ... Answer: It creates and accepts a random move from the set of moves these moves are only possible if they improve the move evaluation function. Trekking is a long or arduous journey, especially on foot. - Hiking is the act of going on long walks in the country for pleasure. ... They both basically refer to long walks. Alpine style trekking involves climbing only with minimal intervals without the help of porters. ... Alpine style contrasts with 'Exhibition' or 'Siege' style. Competitive speed climbing, which takes place on an artificial standard climbing wall, is the main form of speed climbing. However, there are other variations of speed climbing that take place outside.

2. Optimization

Ali and Taw hid a hybrid algorithm that included Solve CSA and Nelder-Meat Mode (HCSANM) integer and minimax optimization issues. HCSANM was started with CSA, which is the basis for many iterations, selecting the best results achieved and recovering Sent, which increased the search and eliminated the slow integration struggle of the basic CSA. Therefore, HCSANM uses CSA as the basis for global research controls, and NM with HCSANM on 10 minimax issues with full number programming and performance verification Used for deep exploitation of system 7 **[45]**. The results showed the performance of HCSANM and Minimax over time to deal with upgrade issues. The problem of linear low squares solved by a hybrid algorithm between Newton's method (NM) and CSA is called CSANM, and The teachers benefited. Ability for rapid integration from CSA and global search and robust local search from NM. Test results show CSANM's integration efficiency and computational accuracy compared to NM (HSNM) based CSA and HS. **[47]** Presented an astute cross breed barbecue hert and CS calculation to tackle constant improvement issues. The new calculation incorporates the update and leaves CS's practices in the Grillhard calculation overhaul process. This Integration plans to work on the double-dealing of the Grillhard calculation. In any case, the KHCS calculation didn't make a huge improvement in execution contrasted with the CS and Krill Herd calculations. Moreover, Krill Herd calculation streamlining administrators in KHCS further develop KHCS execution Every sort of update issues need to improve to amplify. Wang et al. A mixture CS and Harmony search calculation is proposed to change any competitor arrangement prior to refreshing in CS the pursuit utilizes the pitch change process.

The calculation further develops the coordination pace of CS and expands the shot at not getting impeded in neighborhood ideal arrangements. Notwithstanding, it appears to be that the proposed calculation requires a bigger number of estimations than the fundamental CS calculation. **[49]** When considering an improvement issue, mixed media capacities are impacted by huge aspects and simultaneously it is extremely difficult to track down an Introduced an insightful mixture barbecue hert and CS calculation to take care of ceaseless streamlining issues. The new calculation incorporates the update and leaves CS's practices in the Grillhard calculation redesign process. This Integration expects to work on the double-dealing of the Grillhard calculation. In any case, the KHCS calculation didn't make a huge improvement in execution contrasted with the CS and Krill Herd calculations. Moreover, Krill Herd calculation streamlining administrators in KHCS further develop KHCS execution Every sort of update issues need to improve to boost. Wang et al. A crossover CS and Harmony search calculation is proposed to change any up-and-comer arrangement prior to refreshing in CS the hunt utilizes the pitch change process. The calculation further develops the mix pace of CS and builds the shot at not getting impeded in nearby ideal arrangements. In any case, it appears to be that the proposed calculation requires a larger number of computations than the fundamental CS calculation. for hunting the center school. **[51]** Theoretical III.1 and Corollary III.1 integrated GHC algorithms provide insights on how to handle solution space. Macro Transition Matrix (10) Given that, Global Optimus, G, occurs with probability. . Macro iteration k approaches positive infinity (l constant probabilities for any solution approaching zero). Intuitively, this adequate integration provides less than the global probability of avoiding local while generating macro-copy GHC arithmetic. Optimization, while having the greatest probability of escaping any global optimization from local optimization Is zero. For the Global Optima Collection. Similarly, if the required integration level GHC algorithm in Theorem III.1 is integrated into the Global Optima suite, there is little probability of localizing any global optimization optimization on the macro repeat would be zero rather than the greatest probability of escape. Any local optimization is universally optimized when making a macro replay **[60]** the authors He He proposed a system called Communication Based Feature Testing (CFS). This algorithm integrates the rating formula with the correct contact measurement and horror search technique.

A combination of GA and local search contact based mimetic structure Used at work. The Spot Hyena Optimization (SHO) algorithm was used using two different hybrid models of this algorithm. In the first model, SHO to improve the optimal solution after operation Each representative SA was embedded in, and in the second model SA was used to improve the final solution obtained by the SHO algorithm. This algorithm is based on the law of gravity and mass interactions Used an innovative technique called the Gravity Search Algorithm (GSA). In a given way, search agents are a set of masses that communicate with each other based on each other each other each other Newton's laws of gravity and motion. Used in the binary version of GSA **[67]** the structure of Bird mating optimization is made up of bird species and their mating practices. In this way, each bird represents a possible solution to the problem, and the genes of each bird are considered as variables. Mating behaviors for women are parthenogenesis and polyandrous, and this The promising genes obtained through the process are the best-intentioned solutions. This study considers homosexual behaviors, including same-sex marriage, polygamy, and prostitution. Reflects the mating of each type of bird related Calculations are discussed. Monogamy is a type of relationship in which the male bird interacts with the female bird. Polygenesis is a form of polygamy in which the male has two or more Joins women. With regard to prostitution, it refers to the unstable relationship between the male bird and his preferred female mate in the community. In this computational method, luxury birds are produced using a random process. Then, in terms of polyandry, it's a woman's relationship is paired with two or more males, and the offspring are simulated like polygenic birds. **[68]** The main purpose The purpose of this paper is to create an ß-mountain climbing algorithm for puzzle games. An optimization complex at the beginning of the sudoku puzzle game Designed. This problem is solved with the right solution for the easy ones, using some real world examples of small number of violations and difficult problems. ß-Mountain climbing mechanism parameters And is analyzed using different values of the BW parameters. To the best of our

knowledge, ß-Mountain for sudoku puzzles, this is the first study using a climbing algorithm. The remaining sheet is as follows: Section. Provides description and development of Sudoku Puzzle Game II Mountaineering method given next, test results are finally given, results and future directions are indicated

3. Hill-Climbing

The first three generally apply because they require little knowledge of the problem. When the objective activity has an explicit shape, the trek can quickly reach an optimal point by following the local preferences of the process. It is very suitable for our problem system and now we have some algorithms and new algorithm which we will review and recommend later. Simulated Annealing is a commonly used search horoscope to solve global optimization problems, especially in the presence of multiple false minima **[52]**. It is triggered by the annealing process to achieve a material heat equilibrium A simulated annealing optimization is carried out in a metropolitan area at high temperatures. It starts with a simulation of Monte Carlo. This means that a relatively large percentage of random steps leading to an increase in energy will be accepted. After a sufficient number of Monte Carlo steps or attempts, the temperature drops. The city continues after the simulation of Monte Carlo. This process is repeated until the final temperature is reached. The temperature drop pattern is called the cooling table. When the cooling table is properly controlled, the algorithm is guaranteed to achieve global optimal status, despite many successful applications. Effective use of simulated analgesia can slow down an art integration. [6] Estimated and accurate * first half and optimal reverse temperature and problem size, l. Following an argument like the one above, it can be shown that for problems with n size controls, the passing time is measured as Ln + 1. From high temperatures, the equilibrium time can be accelerated by slowly reducing as the walker approaches. Equilibrium time. Global optimized. This is a simulated annealing technique. However, since most of the time it crosses the four barriers, even if simulated annealing uses the optimal annealing table, the first path will only reduce the time by a small fraction. [8] These results are illustrated by considering the condensed cooling tables for the simulated annealing algorithms and showing that the required and sufficient integration conditions in the cooling table are equivalent to the required and sufficient conditions given in this paper. Furthermore, the asymmetric comparative efficiency of the simulated analog algorithms and the random restart of the local search depend on the shape of the cooling table and the adjacent function (hence the problem event solution terrain).

In particular, the analysis suggests that a random restart will perform better than local search simulated annealing if adequate restarts are implemented; The primary value for using simulated annealing may be for a specific time function, which gets the optimal solutions very quickly. [13] This paper provides evidence for integration with Generalized Mountaineering (GHC) methods. Implications arising from this conclusion are discussed, and examples illustrating the GHC algorithm integration conditions are provided. The main contribution of theorems 3.1 and 3.2 is the creation of a large number of dense mountaineering trails where only simulated annealing is possible. For example, if the noise system is removed, it will be easier to escape from any local minimum than the global minimum without symptoms. In contrast, local search and limit acceptance do not meet the critical requirements of the 3.1 and 3.2 theorems. While this does not prove that these methods are applicable, the necessary integration conditions and theories in Jacobson and Yucatan form consensus conclusions such as P.1 3.1 and 3.2, and those lines prove that globally optimal solutions should occur with probability of 3.1 and 3.2 g. Some conditions. One. However, theories do not show how the probability mass is distributed asymmetrically around the world. [15] With the exception of LAHC, kernel optimization attempted to use synchronized annealing during pre-match testing of a successful algorithm. However, this attempt was not successful. Cooling table parameters were found to be very different for MS problems in different sizes. The first three generally apply because they require little knowledge of the problem. When the objective activity has an explicit shape, the trek can quickly reach an optimal point by following the local preferences of the process. It is very suitable for our problem system, now we have some algorithms and new algorithm

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5. Conclusion

Simulated annealing optimization begins with metropolitan Monte Carlo simulation at high temperatures. This means energy A relatively large percentage of random steps leading to an increase will be accepted. After a sufficient number of Monte Carlo steps or attempts, the temperature drops. City of Monte Carlo Continues after simulation. This process is repeated until the final temperature is reached. Cooling table when the temperature drops Is called. When the cooling table is properly controlled, the algorithm is guaranteed to reach a global optimal level, despite many successful applications, making efficient use of simulated annealing an art integration will be slow. The P&O MPPT control system sometimes deviates from the maximum operating point when changing atmospheric conditions, such as broken clouds. Is shown, and this problem can also occur with mountaineering. Simulation results Hill climbing MPPT controller, a system that is far from the optimal point in rapidly changing insulation conditions, the running point changes from time to time. PV output power as shown in Fig.6, abrupt increase or change in change according to HC monitoring algorithm When dominated by deceleration, the controller can become confused and move the operating point in the wrong direction.

Relevant calculations reflecting the mating of each type of bird are Discussed. Monogamy is a type of relationship in which the male bird interacts with the female bird. Polygene is a form of plural marriage in which a man Marries two or more women. As for prostitution, it is a male bird and his favorite female mate in the community Refers to the unstable relationship between. In this computational method, luxury birds are produced using a random process. Then, In terms of polyandry, it is a kind of relationship where a woman joins two or two people more men, and the offspring are simulated. identically. Polygene birds form the system. The second, Simplex-GA, which uses some basic search engines to design the new crossover operator, is described by the Simplex method, And a possible form of Simplex-GA that operates in the humming space. Now the classical neural network The effect of applying this method to the architectural invention problem is that we have used them to evaluate and compare the performance of the proposed methods for maximum performance and the functional maximum Analyzed in Section III. A comprehensive probability model for mountain climbing MPPT has been developed in Section IV In the presence of random noise. This model is used in Section V to classify the behavior of the tracker when there is noise. Misdiagnosis symptoms are theirs are classified according to cause. Several modifications of the algorithm aimed at noise rejection are then analyzed and their performance is section VI. Is. Rated as. Understanding the results of a given analysis allows the error tracker to be corrected quickly and efficiently. This is in Section VII the test method is demonstrated by debugging. The analytics approach can be further extended to other MPPT algorithms with different control variables.

Reference

[1]. Xi, Bowei, Zhen Liu, Mukund Raghavachari, Cathy H. Xia, and Li Zhang. "A smart hill-climbing algorithm for application server configuration." In Proceedings of the 13th international conference on World Wide Web, pp. 287-296. 2004.

[2]. Prügel-Bennett, Adam. "When a genetic algorithm outperforms hill-climbing." Theoretical Computer Science 320, no. 1 (2004): 135-153.

[3]. Jacobson, Sheldon H., and Enver Yücesan. "Analyzing the performance of generalized hill climbing algorithms." Journal of Heuristics 10, no. 4 (2004): 387-405.

[4]. Johnson, Alan W., and Sheldon H. Jacobson. "On the convergence of generalized hill climbing algorithms." Discrete applied mathematics 119, no. 1-2 (2002): 37-57.

[5]. Shameem, Ahmad, and Mohammad Rauf. "Factors Influencing the Implementation of Remote Learning in Higher Educational Institutions in Male" City during COVID-19 Pandemic." COVID-19 emerging socio-economic and legal trends in Maldives.(pp-80-97). Mahi Publication Pvt. India (2021).

[6]. Nomani, M. Z. M., Faizanur Rahman, Mohammad Rauf, and Saif A. Khan. "Access and Benefit Sharing Models of Biodiversity Conservation in International and Comparative Law Perspective." Advances in Natural and Applied Sciences 14, no. 1 (2020): 1-14.

[7]. Burke, Edmund K., and Yuri Bykov. "The late acceptance hill-climbing heuristic." European Journal of Operational Research 258, no. 1 (2017): 70-78.

[8]. Lim, Andrew, Brian Rodrigues, and Xingwen Zhang. "A simulated annealing and hill-climbing algorithm for the traveling tournament problem." European Journal of Operational Research 174, no. 3 (2006): 1459-1478.

[9]. O'Reilly, Una-May, and Franz Oppacher. "Program search with a hierarchical variable length representation: Genetic programming simulated annealing and hill climbing." In International Conference on Parallel Problem Solving from Nature, pp. 397-406. Springer, Berlin, Heidelberg, 1994.

[10]. Al-Atrash, Hussam, Issa Batarseh, and Khalid Rustom. "Effect of measurement noise and bias on hill-climbing MPPT algorithms." IEEE transactions on aerospace and electronic systems 46, no. 2 (2010): 745-760.

[11]. Rueda, Luis, and Vidya Vidyadharan. "A hill-climbing approach for automatic gridding of cDNA microarray images." IEEE/ACM Transactions on Computational Biology and Bioinformatics 3, no. 1 (2006): 72-83.

[12]. Dowsland, Kathryn A. "Hill-climbing, simulated annealing and the Steiner problem in graphs." Engineering Optimization 17, no. 1-2 (1991): 91-107.

[13]. Fonseca, George HG, Haroldo G. Santos, and Eduardo G. Carrano. "Late acceptance hill-climbing for high school timetabling." Journal of Scheduling 19, no. 4 (2016): 453-465.

[14]. LaSalle, Dominique, and George Karypis. "A parallel hill-climbing refinement algorithm for graph partitioning." In 2016 45th International Conference on Parallel Processing (ICPP), pp. 236-241. IEEE, 2016.

[15]. Galbally, Javier, Julian Fierrez, Javier Ortega-Garcia, Chris McCool, and Sebastien Marcel. "Hill-climbing attack to an eigenface-based face verification system." In 2009 First IEEE International Conference on Biometrics, Identity and Security (BIdS), pp. 1-6. IEEE, 2009.

[16]. Tsamardinos, Ioannis, Laura E. Brown, and Constantin F. Aliferis. "The max-min hill-climbing Bayesian network structure learning algorithm." Machine learning 65, no. 1 (2006): 31-78.

[17]. Ramachandran, M., Sahas Bansal, and Pramod Raichurkar. "Scrutiny of jute fiber poly-lactic acid (PLA) resin reinforced polymeric composite." Journal of the Textile Association 76, no. 6 (2016): 372-375.

[18]. Manickam, Ramachandran. "Back propagation neural network for prediction of some shell moulding parameters." Periodica Polytechnica Mechanical Engineering 60, no. 4 (2016): 203-208.

[19]. Renders, J-M., and Hugues Bersini. "Hybridizing genetic algorithms with hill-climbing methods for global optimization: two possible ways." In Proceedings of the First IEEE Conference on Evolutionary Computation. IEEE World Congress on Computational Intelligence, pp. 312-317. IEEE, 1994.

[20]. Lozano, Manuel, Francisco Herrera, Natalio Krasnogor, and Daniel Molina. "Real-coded memetic algorithms with crossover hill-climbing." Evolutionary computation 12, no. 3 (2004): 273-302.

[21]. Kazarlis, Spiridon A., Stelios E. Papadakis, J. B. Theocharis, and Vassilios Petridis. "Microgenetic algorithms as generalized hill-climbing operators for GA optimization." IEEE Transactions on Evolutionary Computation 5, no. 3 (2001): 204-217.

[22]. M. Amudha; M. Ramachandran; Chinnasami Sivaji; R. Gayathri "A Study on Climate Change with Mayfly Algorithm Optimization", Recent trends in Management and Commerce, 2(3), (2021): 23-28.

[23]. Talbi, E-G., and Traian Muntean. "Hill-climbing, simulated annealing and genetic algorithms: a comparative study and application to the mapping problem." In [1993] Proceedings of the Twenty-sixth Hawaii International Conference on System Sciences, vol. 2, pp. 565-573. IEEE, 1993.

[24]. Ceylan, Halim. "Developing combined genetic algorithm—Hill-climbing optimization method for area traffic control." Journal of Transportation Engineering 132, no. 8 (2006): 663-671.

[25]. Sakamoto, Shinji, Elis Kulla, Tetsuya Oda, Makoto Ikeda, Leonard Barolli, and Fatos Xhafa. "A comparison study of hill climbing simulated annealing and genetic algorithm for node placement problem in WMNs." Journal of High Speed Networks 20, no. 1 (2014): 55-66.

[26]. Alomari, Osama Ahmad, Ahamad Tajudin Khader, Mohammed Azmi Al-Betar, and Mohammed A. Awadallah. "A novel gene selection method using modified MRMR and hybrid bat-inspired algorithm with β-hill climbing." Applied Intelligence 48, no. 11 (2018): 4429-4447.

[27]. Shehab, Mohammad, Ahamad Tajudin Khader, Mohammed Azmi Al-Betar, and Laith Mohammad Abualigah. "Hybridizing cuckoo search algorithm with hill climbing for numerical optimization problems." In 2017 8th International conference on information technology (ICIT), pp. 36-43. IEEE, 2017.

[28]. Soniya Sriram, M. Ramachandran, Sathiyaraj Chinnasamy, G. Mathivanan "A Review on Multi-Criteria Decision-Making and Its Application", REST Journal on Emerging trends in Modelling and Manufacturing, 7(4), (2022):101-107.

[29]. Abed-alguni, Bilal H., and Faisal Alkhateeb. "Intelligent hybrid cuckoo search and β-hill climbing algorithm." Journal of King Saud University-Computer and Information Sciences 32, no. 2 (2020): 159-173.

[30]. Ghosh, Kushal Kanti, Shameem Ahmed, Pawan Kumar Singh, Zong Woo Geem, and Ram Sarkar. "Improved binary sailfish optimizer based on adaptive β-hill climbing for feature selection." IEEE Access 8 (2020): 83548-83560.

[31]. Implications on Re engineering in Manufacturing", REST Journal on Emerging trends in Modelling and Manufacturing, 7(3), 2021:70-75.

[32]. Sullivan, Kelly A., and Sheldon H. Jacobson. "A convergence analysis of generalized hill climbing algorithms." IEEE Transactions on Automatic Control 46, no. 8 (2001): 1288-1293.

[33]. Chatterjee, Bitanu, Trinav Bhattacharyya, Kushal Kanti Ghosh, Pawan Kumar Singh, Zong Woo Geem, and Ram Sarkar. "Late acceptance hill climbing based social ski driver algorithm for feature selection." IEEE Access 8 (2020): 75393-75408.

[34]. M. Amudha; M. Ramachandran; Vimala Saravanan; P. Anusuya; R. Gayathri " A Study on TOPSIS MCDM Techniques and Its Application" Data Analytics and Artificial Intelligence, 1(1), (2021): 09-14.

[35]. Amol Lokhande, C. Venkateswaran, M. Ramachandran, C. Vidhya, R. Kurinjimalar. " A Study on Various Implications on Reusing in Manufacturing", REST Journal on Emerging trends in Modelling and Manufacturing, 7(2), (2021): 63-69.

[36]. Ou, Ting-Chia, Wei-Fu Su, Xian-Zong Liu, Shyh-Jier Huang, and Te-Yu Tai. "A modified bird-mating optimization with hill-climbing for connection decisions of transformers." Energies 9, no. 9 (2016): 671.

[37]. Al-Betar, Mohammed Azmi, Mohammed A. Awadallah, Asaju La'aro Bolaji, and Basem O. Alijla. "β-hill climbing algorithm for sudoku game." In 2017 Palestinian International Conference on Information and Communication Technology (PICICT), pp. 84-88. IEEE, 2017.

[38]. Burke, Edmund K., and Yuri Bykov. "The late acceptance hill-climbing heuristic." European Journal of Operational Research 258, no. 1 (2017): 70-78.

[39]. Ghosh, Manosij, Tuhin Kundu, Dipayan Ghosh, and Ram Sarkar. "Feature selection for facial emotion recognition using late hill-climbing based memetic algorithm." Multimedia Tools and Applications 78, no. 18 (2019): 25753-25779.

[40]. Gámez, José A., Juan L. Mateo, and José M. Puerta. "Learning Bayesian networks by hill climbing: efficient methods based on progressive restriction of the neighborhood." Data Mining and Knowledge Discovery 22, no. 1 (2011): 106-148.

[41]. Liu, Fangrui, Yong Kang, Yu Zhang, and Shanxu Duan. "Comparison of P&O and hill climbing MPPT methods for grid-connected PV converter." In 2008 3rd IEEE Conference on Industrial Electronics and Applications, pp. 804-807. IEEE, 2008.

[42]. Xiao, Weidong, and William G. Dunford. "A modified adaptive hill climbing MPPT method for photovoltaic power systems." In 2004 IEEE 35th annual power electronics specialists conference (IEEE Cat. No. 04CH37551), vol. 3, pp. 1957-1963. IEEE, 2004.

[43]. Alajmi, Bader N., Khaled H. Ahmed, Stephen J. Finney, and Barry W. Williams. "Fuzzy-logic-control approach of a modified hill-climbing method for maximum power point in microgrid standalone photovoltaic system." IEEE transactions on power electronics 26, no. 4 (2010): 1022-1030.

[44]. Wang, Hongfeng, Dingwei Wang, and Shengxiang Yang. "A memetic algorithm with adaptive hill climbing strategy for dynamic optimization problems." Soft Computing 13, no. 8 (2009): 763-780.

[45]. Chinnasami Sivaji; M. Ramachandran; Kurinjimalar Ramu; Soniya Sriram "A Review on Weight Process Method and Its Classification", Data Analytics and Artificial Intelligence, 1(1), (2021):01-08.

[46]. Godbole, Nishant, Shajit Yadav, M. Ramachandran, and Sateesh Belemkar. "A review on surface treatment of stainless steel orthopedic implants." *Int J Pharm Sci Rev Res* 36, no. 1 (2016): 190-4.

[47]. Pradeep, P., J. Edwin Raja Dhas, M. Ramachandran, and B. Stanly Jones Retnam. "Mechanical Characterization of jute fiber over glass and carbon fiber reinforced polymer composites." International Journal of Applied Engineering Research 10, no. 11 (2015): 10392-10396.

[48]. Kaur, Mandeep, and Dr C. Venkateswaran. "To study the work life balance among working women, post maternity in banking sector." International Journal of Management (IJM) 11, no. 2 (2020).

[49]. Kalita, Kanak, Uvaraja Ragavendran, Manickam Ramachandran, and Akash Kumar Bhoi. "Weighted sum multi-objective optimization of skew composite laminates." Structural Engineering and Mechanics 69, no. 1 (2019): 21-31.

[50]. Nair, Vineeth, Pratul Khosla, and M. Ramachandran. "Review on mechanical properties of various natural fibers reinforced composites." Research Journal of Pharmaceutical Biological and Chemical Sciences 7, no. 1 (2016): 2001-2004.

[51]. Benin, M. Aniber, B. Stanly Jones Retnam, M. Ramachandran, M. Sivapragash, and J. Edwin Raja Dhas. "Comparative study of tensile properties on Thermoplastic & Thermosetting polymer composites." International Journal of Applied Engineering Research 10, no. 11 (2015): 10109-10113.

[52]. Gadde Mehar Chaitanya, M.P.Jenarthanan, C. Sathiyaraj, "A Review on Glass fibre Reinforced Composites with Different Matrix", REST Journal on Emerging trends in Modelling and Manufacturing, 7(1), (2021):18-24.

[53]. Venkateswaran, Dr C. "Family Responsibilities Make a Barrier in the Career of Female Faculty." Mrs. Deepa Sharma, Dr. C. Venkateswaran." Family Responsibilities Make a Barrier in the Career of Female Faculty". International Journal of Computer Engineering In Research Trends (IJCERT), ISSN (2020): 2349-7084.

[54]. R. Kurinjimalar, S. Vimala, M. Silambarasan, S. Chinnasami. "A Review on Coir fibre Reinforced Composites with Different Matrix", REST Journal on Emerging trends in Modelling and Manufacturing, 7(2), (2021):25-32.

[55]. Sathiyaraj Chinnasamy, M. Ramachandran, Kurinjimalar Ramu, P. Anusuya "Study on Fuzzy ELECTRE Method with Various Methodologies" REST Journal on Emerging trends in Modelling and Manufacturing, 7(4), (2022):108-115.

[56]. Amol Lokhande, C. Venkateswaran, M. Ramachandran, S. Chinnasami, T. Vennila."A Review on Various P. K. Chidambaram, Amol Lokhande, M. Ramachandran, Vimala Saravanan, Vidhya Prasanth, "A Review on Biodiesel Properties and Fatty acid composites", REST Journal on Emerging trends in Modelling and Manufacturing, 7(3), 2021:87-93.

[57]. M. Amudha; M. Ramachandran; Chinnasami Sivaji; M. Gowri; R. Gayathri "Evaluation of COPRAS MCDM Method with Fuzzy Approach", Data Analytics and Artificial Intelligence, 1(1), (2021):15-23.

[58]. Amol Lokhande; C. Venkateswaran, M. Ramachandran, C. Sathiyaraj, K. Nathiya, "Recycling Process Impact in Current Scenario Manufacturing A Study", Recent trends in Management and Commerce, 2(1), (2021):20-25.

[59]. Sharma, Deepa, and DRC VENKATESWARAN. "Discrimination Face Female Faculty During the Recruitment & Selection and Training Time in The Academic Sector." Journal of Contemporary Issues in Business and Government| Vol 27, no. 3 (2021): 1105.

[60]. C. Venkateswaran; M. Ramachandran; Vimala saravanan; T. Vennila " A Study on Artificial intelligence with Machine learning and Deep Learning Techniques", Data Analytics and Artificial Intelligence, 1(1), (2021):32-37.

[61]. Vikrant Sharma; M. Ramachandran; Sathiyaraj Chinnasamy; Vimala Saravanan, " A Review on Structural Equation Modeling and Its Classification" REST Journal on Emerging trends in Modelling and Manufacturing, 7(4), (2022): 135-142.

[62]. Rauf, Mohammad, and M. Z. M. Noman. "Socio-Legal Dimensions of Family Health under Marital Settings of Marriage and Divorce in the Maldives." European Journal of Molecular & Clinical Medicine 7, no. 11 (2021): 5215-5221.

[63]. Rauf, Mohammad. "Issues and Impact of COVID-19 on Socio-Legal Aspects of Human Life: A Case Study of Greater Male Region'in the Maldives." Asian Journal of Research in Business and Management 3, no. 1 (2021): 70-79.

[64]. Nomani, M. Z. M., Jalal Allail, and Mohammad Rauf. "Environment impact assessment draft notification 2020: An eco-legal assessment." Annals of the Romanian Society for Cell Biology (2021): 2900-2905.