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Algorithm and Design Techniques -A Survey

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Abstract

Algorithm design plays a significant role in development of any application that is concerned with engineering and technology. Advancement in implementation levels of algorithms made a good impact with the model developed. Meanwhile, the time and space complexity of the execution of the algorithm varies with regard to the input to the algorithm upon fixation of various parametric levels. This paper summarizes a survey on various algorithm design techniques and its applications. The applicability of the algorithms varies with regard to the problem and the nature of computation levels.

Index terms— algorithm design; linearity; dynamic programming; greedy techniques; non-linearity.

1 Introduction

n algorithm is a step by step procedure which helps us to solve a problem in a sequential order. The problems are all different from one another. There are different techniques of algorithm which are suitable for each problem. The techniques are Divide and Conquer method, Greedy Method, Dynamic Programming and Backtracking. In divide and conquer, the original problem is divided into sub problems and these sub problems are solved individually then combine the solved problems to get a solution for the original problem. In greedy algorithm, it produces an optimal solution for a problem. Greedy algorithm is generally used to solve a complex problem rather than an easy one. It breaks the complex problem into a small instance and solve them recursively until the best optimal solution is gathered from the small instances of that problem. Dynamic programming technique is used to optimize the result by divides the problem into smaller sub problems and solving the smaller problems to obtain the ultimate problem. This technique recursively solves the program to obtain the optimal solution for the problem. Backtracking algorithm is an optimization technique where the solution for the problem can be backtracked many number of times until the best solution is obtained from the algorithm. The backtracking process is different for the different problem. Branch and bound technique is the another method of solving a problem to get the optimal solution. This algorithm technique is mainly used to produce the lower cost for the problem along with optimal solution. The last technique is the linear programming whereas the solution for the problem includes the maximum profit, shortest path and also in lower cost for that solution. In algorithm, the there are two types of data structure. They are liner data structure and nonlinear data structure. In linear data structure, the data are arranged in the sequential order but in nonlinear data structures, the data are not arranged in sequential order but in random manner. The linear and nonlinear structures helps to store the data with the algorithm technique this data can be efficiently handled. There are many algorithms which help to manipulate the data in different forms. The linear algorithms are array, linked list and stack and queue. The array helps to store data in the each index present in the array. The linked list is of three types, they are single linked list, double lined list and circular linked list. These linked lists are used to store data in the form of node. Each node consists of both data section and link section, where the data section consists of the data of each node and in the link section it contains the address of the next data to be stored. In stack data structure, the data are stored in FILO fashion. The first entered data are to be deleted at the last time form the stack. In the nonlinear data structures the algorithms presented are trees, graphs, dictionaries, heaps and tries. In trees, the data are stored in tree format where the tree can be in various forms such as binary search tree, AVL tree, B tree and Splay tree. In graph data structure, there are algorithms such as Bellman ford and Floyd warshall. In dictionary, skip list algorithm is used to help the data structure for the efficient storing of data. In network data structure, the Ford Fulkerson and Edmond karps algorithm are used to store the data in handling the data in

the network format. In tires, there are three formats. They are standard tries, compressed tries and also suffix tries. In addition to these algorithms there are text matching algorithms such as Brute force algorithm, Boyer Moore algorithm and KMP algorithm. The text compression algorithms are Huffman coding algorithm where the compression of data is used to handle the encoding of data.

2 II.

3 Literature Survey

Maximum Independent Set Approximation Based on Bellman-Ford Algorithm by Mostafa H. Dahshanis proposed by in this algorithm to be found the approximate solution for the maximum independent set problem. It is treated to least cost problem to be taken by in this novel approach. It can be used to bellman ford algorithm adapted version Source is consist of all vertex and vertex should be measured by the number of vertex excluded in this vertex independent set are included. The run time of the these algorithm is approximately O(n(n2-m)). The proposed algorithm is significant changed by several bench marks and random generated graph are improved. In this method include one of the best greedy algorithms. Future work is proposed algorithm to be only focused on run time and space requirement and lower bound theoretical independent numbers. Mathematical formulations and exact algorithm for the multitrip cumulative capacitated single-vehicle routing problem by Juan Carlos Riveraa,b, * , H. Murat Afsara, Christian Prinsa is proposed by In this paper is CCRVP disaster manage the single tripe arrive problem. Single vehicle arrive the short period reach in to destination and to successive tripe to set off affect sites in which that select the minimization of standard. If it is used to two types of programs like flow based model and set partitioning model. Bellman ford algorithm to direct acyclic resource constrains so it's reduce the path of the sites. The future work the version of node routing problems to be detect in selective VRP. Mt-CCRVP includes the column generation scheme. Similar to the sum of the arrival time to be reflected is also interesting the priorities.

An Efficient Implementation of the Bellman-Ford Algorithm for Kepler GPU Architectures by Federico Busato and Nicola Bombieri, Member, IEEE. Is proposed by in this algorithm find the single path problem it is find best solution for single source shortest path. They are applied to many core architecture of parallelized. High degree of parallelism is cannot surely performed at the cost of low work adeptness. If they are compare to the similar algorithm the work consumption is a waste of power. The bellman ford algorithm parallel implement to in this process it can be involved to exploits architecture of recent GPU architecture. To improved GPU performance and work efficiency. In this paper focused to two things one is algorithm and another one is GPU architecture. Parallel Implementation of Bellman-Ford Algorithm Using CUDA Architecture by Ganesh G Surve, Medha A shah is proposed by the larger graph involves to multiple of vertex and edges. The millions of vertex are apply many real time common applications and face to many challenges. Now a day multiple of application like travelling problem, shortest path problem, routine network and robotic system in these application are based to data routine techniques in this data represent in a graph. The graph is direct and negative cycle weighted graph. Now a day growing the data application but still situation need for speed and real time response. The serial algorithm takes large amount of time. An optimization problem in graph theory of bellman ford algorithm easy to solve the single source shortest path problem. In this paper improve the GPU architecture of NVIDIA performance and workload efficiency and it is implement the bellman ford algorithm. In this paper newly introduce the parallelizing Bellman-Ford Algorithm and implement the new version of the algorithm over the CUDA framework. The NVIDIA programming interface name is CUDA. The future work is done by they are modifying the bellman ford algorithm. The divided in to the partitioning and execution of algorithm for both CPU and GPU architecture. They are used to obtaining higher massive parallelism and vectorization.

Efficient Implementation of the Bellman-ford algorithm for GPU by Marjan Nazarifard, Davoud Bahrepour is proposed by Bellman ford algorithm is only focused to solve the shortest path to the source node. It can be enabling to negative cycle weighted graph. It is fine single source path problem and analysed by graph used to common algorithm. Moreover, it is represents a class of parallel algorithms, the memory accesses and work distribution of which are both irregular and datadependent. Recently, graphics processors have been used for implementing many algorithms, as well as an accelerator in supercomputers. Several SSSP algorithms have been proposed based on graphics processing units (GPUs), each of which could traverse a specific type of graph. In this paper, we accelerated the Bellman-Ford algorithm on GPU using CUDA, so that it could traverse dense and sparse graphs (regular and irregular) within the shortest time compared to the previous algorithms. According to the simulation results, the proposed implementation provided an average speed-up of 1.87x compared to most of the previous parallel implementation algorithms. Future work is done by If it is future work to remove the feck threat in beginning of the process. So reduce the time and memory. The way of feck threaded path to be allotted by another thread.

Demonstration of Single Link Failure Recovery using Bellman Ford and Dijil (stra Algorithm in SDN by Syed Waleed, Muhammad Faizan, MaheenIqbal, Muhammad Irfan Anis is proposed to In this paper to be found the failure recovery mechanism was software defined network it is conducted to development of employee nodes. In this SDN domain is rarely used the algorithm field. It's allows to network inside programmability. In node failure recovered dynamic application building of bellman ford algorithm. The bellman ford algorithm is implemented by loop confrontation and reduction. They are compare to another second algorithm is Dijkstra's algorithm.

Dijkstra's algorithm failure recovery mechanism to be compared based on the node bandwidth allocation. The future work is the Dijkstra's algorithm techniques are reducing the processing tine and calculate the any A bag of paths framework for network data analysis by Kevin Francoisse, IlkkaKivimaki, Amin Mantrach, Fabrice Rossi, Marco Saerens, is proposed to analysis the network data it is generic framework as (BoP). The network path is assign to the probability distribution format. The two node are connected to the probability capture notation based and It has connect high accessibility preferably low cost paths so it is extended to the bellman ford algorithm. Future work done by to be investigating the graph cut the path instead of link. We also plan to evaluate experimental the potential distance as the distance between sequence of character by adapting it to a directed acyclic graph.

To be investigating the graph cut the path instead of link. we also plan to evaluate experimental the potential distance as the distance between sequence of character by adapting it to a directed acyclic graph by Anggie Nastiti, Andrian Rakhmatsyah, Muhammad Arief Nugroho, is proposed to In Telkom University, the topology used does not have backup link for campus internal network in case of link failure because the topology is still based on inter VLAN where each switch only has one path to switch core. Data packets cannot be delivered from source to destination if there is a link failure on the path. Based on the problem, it is proposed a new architecture which is Software Defined Network (SDN) that can overcome the link failure by configuring the controller in order to move to alternative links that have been provided with Open Flow. This architecture separates the control plane and data plane, so it is centralized and programmable. To look for alternative links when a link failure occurs, the shortest path algorithm is Dijkstra and Bellman-Ford algorithms. The test parameters performed in this research are functionality to determine whether the two algorithms can determine the path or not, and convergence time to find out how long it takes to form the path from source to destination. Scenario of the test is done before and after the link failure occurs by using Ryun as controller and Minuet as emulator. Based on the results of the tests conducted, it was found that Dijkstra and Bellman Ford algorithm can be applied well on link failure emulation in accordance with the scenario and topology used in the test. In addition to convergence time parameters obtained that Dijkstra algorithm is superior compared to Bellman-Ford algorithm. The difference gained in both scenarios has a value that is not so great the difference. The future work done by some links are disconnected, both Dijkstra and Bellman-Ford algorithms find alternative paths to delivery data packets from sources to destination. As for the convergence time test, it was found that Dijkstra algorithm is superior to the Bellman-Ford in scenarios before and after a link failure occurs. The difference between them is also not big. This is because the Bellman-Ford algorithm to find the shortest path always checks if there is negative weight cycles or not, so as to make search path becomes longer. Differences in the number of links it was decided also to affect the value of convergence time obtained.

On the optimality of bellman ford Moore shortest path algorithm by Stasys Jukna, Georg Schnitger, is proposed to The lower bound of the Switching and rectifier networking size is over any semiring is a zero characters. The minimum semi ring is also zero character.

So it is used to bellman ford-Moore dynamic algorithm in which to find the shortest path for S-T. the future work is done by In this paper consist of single variable labelled Switches. If can extended in this model added to the some Switching networks. It is extended to random combination with integral factor. So albeitbellman fords Moore switching network does not add some peripheral structures in which problem to other minimization.

Face Image Abstraction by Ford-Fulkerson Algorithm and Invariant Feature Descriptor for Human Identification by Dakshina Ranjan, Kisku Debanjan Chatterjee, S. Trivedy, Massimo Tistarelli is proposed by In this paper discuss about the face image abstraction let used to SIFT features and ford Fulkerson algorithm. Ford Fulkerson algorithm solves the maximum flow in flow network. It can be drawn on face image extract from SIFT feature. If find the augmenting path is exit then and Augmenting path fine the based on vertex. The flow of source to destination of flow value is augmenting path. All vertexes along with edges calculated to one of the paths. In this process until obtained to multiple of times produce the number of different flow paths. The path to be compute residual capacity of augmenting path. The result of in this paper is capture the face image directed graph contains spare characteristics of objects. Ford Fulkerson algorithms apply to direct graph maintain a capacity. Run time of algorithm is o(VE) v is a vertex and E is a edges. Future work is used to face image meth pairs for calculating matching proximity. They are focused to the maximum flow of key words.

Hydraulically informed graph theoretic measure of link criticality for their salience analysis of water distribution networks by Aly-Joy Ulusoy, Ivan Stoianov and Aurelie Chazerain is proposed by in this paper algorithm is include by water Distribution network. This network to be complex for interconnected. It is built to resilience based on energy redundancy. Failure condition operation is maintained. There are analyse the salience of WDN used various methods it is analysed to base on sorrow gate way network measures. The future work is done by apply the WFEBC method. They are arrange to operational network in validate of order to robustness. The also explore the hydraulically in formed graph. The theoretic link measure to be critical approach of hydraulic models. In this model based salience analysed.

Chance distribution of the maximum flow of uncertain random network by Yuhong Sheng and Jinwu Gao is proposed by the uncertain variables and other random variables are called as uncertain random network. In this paper to be solve the maximum flow of uncertain random network. It might be change the distribution of uncertain random network. In this paper implement the maximum flow of distributed uncertain random network.

It is only focused on maximum flow of uncertain network. The future work is data analytics method to be used and improve the sufficient mathematical approach.

Minimax properties of some density measures in graphs and digraphs by Janet Anderson, Hong-Jian Lai, Xiaomin Li, Xiaoxia Lin & Murong Xu is proposed to For a graph G, let f(G) denote the connectivity ?(G), or the edge connectivity ?(G), or the minimum degree ?(G) of G, and define f(G) = max{f(H) : His a sub graph of G}. Mutual in [K-components, clusters, and slicing in graphs, SIAMJ. x theorems related to ?(G) and ?(G), and obtained polynomial algorithms to determine ?(G) and ?(G). The restricted edge-connectivity of G, denoted by ?2(G), is the minimum size of a restricted edge-cut of G. We define ?2(G) =max{?2(H) : H?G}. For a digraph D, let ?(D), ?(D), ??(D) and ?+(D) denote the strong connectivity, arc-strong connectivity, minimum in-degree and out-degree of D, respectively. The future work is the connectivity of graph is activate to the polynomial algorithm method we are try to new version of the algorithm.

Using basis dependence distance vectors in the modified Floyd-Warshall algorithm by W?odzimierz Bielecki ? Krzysztof Kraska ? Tomasz Klimek is proposed to In this paper, in this paper to be focused on Floyd-Warshall algorithm. Floyd-Warshall algorithm to be modified for this paper approach. Where the algorithm is most dependent to time consumption it is calculated to self-dependent of loop statement. In this statement is applied to self-dependence. The self-dependence is consisting of distance vector derived from all vectors description. The present approach is reducing the transitive closure calculation. Transitive closure of dependence graph is increase the applicability scope.it is being to build for optimization compiler. The results of experiment for parallel benchmark are discussed in NASA. Future work is application of the presented approach for extracting both coarse-and fine -grained parallelism for different popular benchmarks.

Probabilistic Calculation of Tolerances of the Dimension Chain Based on the Floyd-Warshall Algorithm by A. V. Muholzoeva, V. B. Masyagina, b,* is proposed to In this paper proposed to process to mechanical engineering is a time consuming of tolerance analysed it take requiring automation. In this algorithm developed to individual chain to be identified.

In this task is more difficult. The algorithm is avoiding the difficult logarithmic procedure. They are followed by the Floyd war shall algorithm for probability of closing tolerance units. It calculates the graph length of the path by adding the length of pairs. The algorithm is identifying individual dimension. In this method to be complex for solve the entire structure of the graph. The future work is added to calculate the dimensional circuits and significantly implemented. They are used new version of the graph algorithm.

Shmuel T. Klein, MiriKopel Ben-Nissan (2009) proposed Boyer Moore algorithm can also be used for the binary data where the processing can only be done on the entire blocks so the number of comparisons done can be reduced. This method is applied to the BM algorithm with small change in the delta value. The mismatch occurs only when the length of the suffix of the pattern bytes is not matched with the length of the full text bytes. Here, instead of comparing the one bit with other it can also be done with a four bytes' comparison such as word. It reduces the comparison and also the time complexity of the process. In future, the authors proposed that it can be also used for the Fibonacci codes where the fast search is possible in the binary data.

Frantisek Franek, Christopher G. Jenning, W. F. Smyth (2007) proposed the combination both KMP Knuth Morris Pratt Algorithm along with the Boyer Moore algorithm to form a new algorithm which is a hybrid algorithm. Here, it compares the text with the pattern in the normal form as done on KMP algorithm if the text is not matched with the pattern then the Sunday shift takes places where the method is similar to the BM algorithm's whole shift process where the text is not found anywhere in the pattern. The benefits of both KMP and BM is combined to form this hybrid algorithm. Thus, it producing a time and space complexity of (m + k) times. This proposed method can be applied to the faster algorithm where it avoids the text that are not matching with each other.

Ain Zubaidah Mohd Saleh, Nur Amizah Rozali (2015) proposed the Boyer Moore algorithm which can be used to find the vulnerability in the websites. This method is more useful than that of the other traditional methods in terms of results. Here, the false positive is completely avoided to produce higher results. Uniform Resource Locator (URL) is used in the BM algorithm to detect the vulnerability for finding the two process which are efficiency and accuracy of detection of the vulnerabilities. In future, this proposed method can also have applied with hybrid algorithm to provide more accurate results.

Phyela Mbewe, Sampson D. Asare (2017) proposed that the Huffman coding algorithm which is a text compressing algorithm is used in the images. The image files are compressed with the help this algorithm to reduce the size and time complexity of the process.

Here, the Adaptive Huffman coding results is compared with the Arithmetic Huffman coding results to get the precise results for the image compression. The Arithmetic approach is better the Adaptive in terms of the space where the Adaptive algorithm is better than the Arithmetic algorithm in terms of the time. Here, this method is applicable only to the files of images which are all in larger size. In future, the authors proposed that it can also be applied to the social networking and the big data images also.

Yosang Jeong, Myungho Lee (2015) proposed that the Boyer Moore algorithm calculates the two shift rules of the strings in the preprocessing phase. In the second phase, the matching operations are to be performed against the text of the string. The pattern matching process is a time consuming process and it requires parallelization of the process to reduce the time consuming process. This can be achieved in most of the CPUs and also applied to the many core processors. It can also be applied to the multi core processors. This type of parallelization is

helpful for the optimization of the load balancing using threads, and also helps the results generated are less time consuming than the normal process. In future the authors suggested that this can also be applied to the GPUs such as CUDA programming which also helps to retrieve the pattern matching of the strings.

Ahsan Habib, Mohammad Shahidur Rahman (2017) suggested that the compression process of the Huffman coding is same but it has different decoding process which helps in fast production of the results. It can be done with the help of the quaternary tree helps to reduce the time used by the algorithm. It contains both the quaternary Huffman encoding and quaternary Huffman decoding process. It is done by replacing the binary tree with the use of the quaternary tree. This process can be used in the client and server environment which reduces the time delay between the decoding processes. It provides high end security with less amount of time taken for the decoding purpose.

Thierry Lecroq (1994) proposed that the Boyer Moore algorithm where the position of i in the text, which helps to compute the length of the longest suffix which is to be find from the text ending at the position. This technique is used to find the text form the word. This method is better than that of the earlier method of Boyer Moore method. This automaton helps to find the largest number of word from the process. This process is further used to calculate the matching pattern.

Yih-Kai Lin, Shu-Chien Huang, and Cheng-Hsing Yang (2011) proposed that the new Huffman Coding method is better than that of the conventional method of Huffman coding. Here the result produced by the new algorithm ranges from 1.91 to 2.13 where the processing unit is 10. Tree grows and Tree prune is applied to the decoded version the Huffman code tree structure. The running time increases with due to the increase in the cache misses and also y the reduced time from the average decoding symbol of the table. This process maintains the efficiency of the decoding process of the algorithm.

Bruce W. Watson (2002) proposed that the new algorithm form a precomputed and tabulated function with the help of the shift functions. This shift functions are far better than that of the Knuth Mooris Pratt algorithm where the time complexity is much reduced in this process. Here, the authors used to approach two methods where the first approach helps to use the shift distance which improves the algorithm. In second approach, the shift distance helps to find the matching text from the pattern.

Wei-Wei Lu and M.P. Gough (1998) proposed that Huffman coding algorithm with the use o two trees. They are front tree and back tree. The front tree is an adaptive Huffman code, the symbol is encoded only with the number of occurrence or frequency of the symbol. The symbol with high frequency is placed in the front tree where as the lower frequency is placed in the back tree. The proposed algorithm is 2.5 times faster than that the Huffman coding. The compression efficiency of the new algorithm is affected by the dispersion of the data. Here, the new algorithms have less dispersion of data where the compression of the data is practically higher.

Ghim Hwee Ong (2000) proposed that Heap sorting method is used to sort the data in the Huffman coding algorithm where this method provides efficient result than that of the traditional approach. Here, the Heap sorting method i applied on the binary tree of the algorithm. This algorithm provides less time complexity in worst case also. This process is applied to the reverse process applications which are required in the real time process.

Steven Pigeon, Yoshua Bengio (1993) proposed a new method Huffman Coding method consists three conceptual methods. The methods are set representation, set migration and tree rebalancing. Set migration moves symbols form one set of data to other. This process helps to ease the rebalancing method where the time complexity is at the O (log p(s)) times. This method concludes that the M algorithm is much slower than that of this Huffman coding algorithm. In future, this method can efficiently apply for the memory management method.

Wang Zhe, Chen Jun, Yuan Gang Zhao Zhou Yan (2001) proposed that a new algorithm where the matching of image is done with the help of KMP algorithm. Extraction of the contour, extracting the contour of fragments as done with the help of this algorithm. The whole algorithm depends on the hardware which provides efficiency and accuracy. This can be widely applied to the medical field for the detection of diseased or affected region of the body from normal function.

Qingzhu Meng, Zhenming Lei, Dazhong He (2017) proposed that the KMP algorithm with modification that can be applied to the traffic analysis. Partition algorithm is used here is the k means algorithm produces the actual solution to the problem which improves the efficiency of the KMP. This KMP algorithm is customized with the traffic analysis. This algorithm can be applied to the hardware application is also depends on the efficiency and accuracy of the data. This method is efficiently applied for the secure environment where the traffic signals are to be prompted with this approach.

The improvement of the brute-force searching algorithm is proposed in the name of Star-End-Mid algorithm by Abdeen. This proposed algorithm is not preprocess neither the pattern nor the text to perform searching. The start-to-end algorithm start the searching process by comparing the first character of the pattern and first character of the given text. If the first character is matched then the last character of the pattern and last character of the text from taken sample. If the last character of the sample matched then character by character comparison will take place for the taken sample, for the remaining character there is no need to take comparison. The proposed algorithm start-end-mid avoids the preprocessing for the pattern therefore this improves the time complexity involved in brute-force algorithm. The future work of this algorithm can be implemented for effective string searching on huge volume of data and also well suited for hospital patient management software for simple

and fast search of patient details with the given sample of pattern. The algorithm Start-End-Mid works based on the idea of first, last and mid character of the pattern is compared with the first, last, mid character of the text for the given sample. This start by seperating the text into two segments from the index 0. In the second step it will compare the first character if the match occur it will move on to the second step else it will move on to next index of character. In the second step the last character of the pattern is compared with last character of the text if the match occurs then it will proceed the next step else it will go to the second step. In the third step it will check the length of the pattern if it has two character then follows the next step. If it has more than two character then compare the floor(length of the pattern/2) of the pattern with the text floor(length of the pattern/2) character, from this the if a match occur, it will take two the next step else it will work ok next segment of the text and follow the step 1.The improved version of brute force algorithm that is Start-End-Mid working process of checking has been improved the time of searching by avoiding the character by character matching comparison. The Start-End-Mid algorithm time complexity is o(((n-m)+1*(m-3)). LUPIN by using the brute force algorithm, topology of the wireless network is optimized. This optimization will ensure the reduction involved in computational complexity of the algorithm by implementing multi-thread application for processing optimization. The topology of wireless network connection should contain point-point, point-multipoint, peer-peer. These stages of network topology of spatial distribution of forming communication channel this in turn to create various types of optimization algorithm. The requirements need to be undertaken while optimiziting the network topology such that cost, level of security, uniformity. The genetic algorithm is often used to solve problems in optimization, which is based on natural selection. The genetic algorithm can be used where the standard algorithm can't work well to resolve the optimization problem. There is computation complexity and difficulties in genetic algorithm as well as in modified genetic algorithm (Bhondekar et al). the proposed algorithm for optimization is based on search algorithm called Brute Force Algorithm. Due to the improvement in processors and accelerators the implementation of brute force algorithms became more. The finite set of network elements (E n) occupies the possible position points (P k). The number of possible position points should be larger than the number of element (k>n). The D n is the N-dimensional vector which is the solution of the problem and it belongs to the position points. F is the function finding distribution of the element (F(d n)=min(max)). This problem allows the brute force algorithm to a multi-thread application. The optimization criteria should contradict each other (the accuracy of function should depends on coordination of antennas). This is the problem of multicriteria optimization. In corresponding to the criteria function, brute force algorithm makes analyses and select the option for that and providing invariance of algorithm. The computation complexity is defined as O(K n), k n is calculated for each points. The decision will be obtain as a set of local optimum variants where, by the fragmentation of the topology, the task of network topology design to a simplified to reduce the computation. The parallel platform algorithm is taken because the design of network topology is much complicated. To determine the location of element in wireless network is confirmed by using the brute force algorithm. This brute force algorithm is very effective and there is no need for any reorganization of application due to invariant in relating to criteria function.

The implementation through FFT and IFFT (inverse fast Fourier transform) to examine fast discrete convolution algorithm by HAYANAL. In some case, the combination of FFT and IFFT in fast convolution allows better freedom by selecting valid twiddle factor. By exploiting the freedom and use SAT solvers in order to find new fast convolution algorithm with very minimum count of operation. To find FFT algorithm within larger solution space the working of brute force search algorithm state of the art Boolean satisfiability (SAT) solvers. The future work employed on this algorithm SAT

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Volume XIX Issue III Version I 48 Year 2 019 ( ) C based brute force search will explore enlarging the solution space, and also formulating search objectives other than reducing the operation count. The proposed SAT based brute force search is used to find FFT algorithm with lower flop count than the split-radix and higher flop count than tangent FFT, due to the constraint that the twiddle factor must be nth root of unity. In order to search selected instance than that will require fewer flops, in large FFT so we can cast the search as based on Boolean satisfiability (SAT) problem. By using satisfiability modulo theory (SMT) the integer arithmetic (mod n) accommodation will done. The search will take place by two modification to FFT search to be made first modification done in the bottom row node of the FFT (no cost).final multiplication undo any of the residual weight on base, these multiplication will not needed in the final fast convolution will equal, therefore FFT flow graphs are feasible to search. Finding fast convolution algorithms with the lowest known operation count is done by the brute force search techniques based on SAT. This ensures the constraints of the formula by the established bounds for the lowest possible FLOP count in the fast convolution.

The parameter search in a four dimensional space using an epipolar parametrization. With very simple and easily parallelizable computation we can do exhaustive search of parameter space by ENGVIST. A simple brute force algorithm which possess Robustness to outliers, No algorithmic degeneracies, cost function based on reprojection errors, not dependent on a good initialization, this ensures that the algorithm resulting in an effective method. The brute force search proposed method is used to estimate the relative orientation is to search rotation matrices R and R' for as many points correspondences as possible. The two rotation matrices is used to represent a relative orientation is an over parametrisation. The rotation s about the z axis is then R, R' and SR, SR' should describe the same relative orientation. For the given level of discretization and error threshold

the maximum number of inliers is computed which has relative orientation. The other cost functions: inliers are correspondences with reprojection errors less than some prescribed thershold this will yeild good result. In the motion restriction (planar motion, small motion) a few standards are restricted and one advantage of estimating relative orientation is that restricted motion and this can be handeled very easily. The main role of motion segmentation is to estimate all these motions as well as the motion of the camera for the given sequence of moving object by the brute force algorithm. Further improve the motion segmentation by spatial prior assuming that close points probably belong to the same motion. Using Map Reduce model we can achieve parallelize the algorithm. CUDA is one of the best example for parallel implementation. Therefore the brute force algorithm approach becomes a viable and robust alternative for real-time visual odometry.

The brute force search algorithm is very essential optimal for the local string search problems and can be substantially be improved when it applied to classical NP hard string by GUO. In this we addressed two types of problem such that Closest string, Longest common subsequence string Closest string: in local search varient of the closest string, let A be the some arbitrary alphabet, and n be a positive integer. The input is a set T ? A n of string d be the integer. The main aim is to find whether there is a string. The closest string can be solved by brute force algorithm in O(n k+1 .m) time. Longest common subsequence problem need to find an input set T of a string S with some specified length L such that S is a subsequence of each string t . ? T. The brute force algorithm solve this longest subsequence problem in n o(k) time. By considering the Hamming distance as a metric for defining the local neighbourhood where the search is performed, under this metric the brute force algorithm cannot be improved but other metrics are interestingly deserve important consideration. The local search algorithm can be substantially improved by applying brute force algorithm to the NP hard classical string problem. This local search can be applied by implementing brute force algorithm for many NP hard string problems. The optimal solution for local search is brute force algorithm.

The information security can be enhance by implementing hash algorithm for verification of digital signatures, key derivation, and random bit generation by RAVILLA, PUTTA. In this first the Zone routing protocol and hybrid MANET protocol is being implemented in NS2 and hashing algorithm and keyed hash message authentication code -secure hashing algorithm 512 is implemented for the authentication and data integrity of the information. Trust-based system is also used to prevent Denial-Of-Service attacks. The feature of this work will expand ZRP to SZRP so, this ensure the data confidentiality between source and destination. This method of work will lead the military operation into a very secure way by preventing it from eavesdropping. Digital signature is one of the authentication mechanism. It is created by taking the hash of the message and with the help of private key, the message is encrypted. The length of the hash code is very important against cryptanalysis such as brute force attack and also it should be a one way property (irreversible). where H(x) = h. SHA-512 is used to hash a message (M), with length(L), 0 less than or equal to L less 2128, each block has 1024 bits which denote the 64 bit words, the output of SHA512 is a 512 bit message digest. In SHA-512 the preprocessing will take care of padding the message, parsing message into message blocks, and setting initial hash value. Trussted based system is the cryptographic based system which ensures the additional security to the network by identifying the malicious code in the network and differentiate it from trusted nodes this done by setting timer while sending data. The turtvalu of the node increase for all transmission and reduce for the nodes who not send data, their trust value is reduces for certain thershold, they are deemed malicious. The malicious node is broadcasted and kept isolated from the network (no service is offered). Trust Value = (Sum of '1' or '0')/Total Sent Packets By implementing two techniques namely HMAC-SHA512 for providing data integrity along with authentication and trusted based system to make secure network. The proposed protocol is used give to better result which is based on cryptography based algorithm.

The hash function is designed with new technology based on chaotic neural networks due to the properties of chaos and neural network, such as non-linearity, compression, confusion, and diffusion by ABDOUN, SAFWAN. The proposed system is not using simple chaotic maps, because the simple chaotic map is not robust. It integrates a strong chaotic generator into neurons. This proposed algorithm is very efficiency against strong collision resistant and high message sensitive when compared to SHA-2. It consist of 2 layers an input layer and output layer. Where k is the secret key, M is the input message and H is the hash value. The chaotic generator will supplies the parameter and condition. Thus the parameter and condition constitute the two layers by sub keys. The transfer function will have two chaotic maps such as Discrete Skew Tent Map and Discrete piecewise linear chaotic map which was connected in parallel. The future work will extend the algorithm to be against of cryptographic attacks such as Birthday attack, Collision attack, joux multi-collision, Long message, Second pre image, Herding, and Meetin-the-middle attack. Thus we obtained the uniformity of hash values and the message sensitive, by a strong hash function therefore the proposed hash function is better then standard SHA-2. This hash function ensures the data integrity, digital signature, and authentication.

The proposed method is based on optimization of classifiers using quadratic probing by KUMAR. The time complexity for sequential search is O(N), where N is the number of rule in a rule set. The search time can be reduced by reducing the quantity N. We found that same address and protocol fields are shared by different header fields, this succeeded by decompose the rule set and map the hash table. The numbers of entries in the classifiers are reduced on the basis of hash value generated by hash function. In the first step an appropriate hash function is selected to generate efficient hash values, this function is applied for each field value of rule-set in classifier. In case collision occurs, the counter is increased by one for the value and a new hash value is generated. This step

is continued until collision is resolved or hash table is full. The procedure is susceptible to false negative value if hash table is small. But this situation is avoidable using appropriate size of hash table. With the advancement in communication technology, gigabit networks are becoming more. The traditional processors do not have sufficient processing capabilities to handle and process packets arriving at such high speed. So in order to fulfil the need of high processing. This techniques has been used in future work by merging this with the tree based classifier and future the processing time is reduced .This method will considers the header fields repeating in the classifier only once so, that the size of the classifier table is not supported for incremental update and the size of the table is reduce significantly. This is tested under three classifier such that ACL rule-set with916 rules, firewall rule-set with 791 rules, IPC rule set with 1500 rules. Therefore the three values 50,100,150 are used for the modulus operation performing on the header value of classifier. And the values of header and classifier is interchangeably used. Thus the complete packet preprocessing structure for effective scalable packet classification in ip forwarding is done by packet preprocessing scheme. This can also be used with high speed network.

The encrypted message is also not secure over the transmission so the security improved by verifying with digital signature, where the hashing algorithm is used to design the improvement by SHARMA, KOPPAD. SHA-3 algorithm is designed using verilog HDL and simulated in Xilinx ISE v14.2. SHA-3 is designed which has fixed output 512-bit, the improvement is done to increase the performance of frequency pipelining, which also includes Clock gated pipelined SHA-3. the combinational SHA-3 algorithm is designed with fixed output length 512 bits. Input at any size. Then input padding module will pad required numbers of zeros when sel signal for MUX is 0 then input bit connect to theta via MUX, this followed by xoring the input with round constant. The input of MUX and DMUX is controlled by FSM(finite state machine). This has three output mux_sel, dmux_sel, and counter_en and connected to selected line of MUX,DMUX. MUX, DMUX will be one then the output iota stage will fed back to theta stage for next round. This continues for 24 round. The pipeline is done in order to increase the performance of SHA-3.between the step mapping the register is inserted. 1st register is placed between theta and module, second in between rho and pi module, last is placed between chi and iota module. These registers are controlled by the input clock signal and clock enable signal. Clock gating is implemented in pipelined registers. The last based clock gating is applied to the pipelined SHA_3 the clok is controlled by by a clock signal. 0 when clock is not required and 1 when clock is required. This in turns prevents the glitches from propogation to clock.

The complexity is focused to show that the shortest path problem is N-P hard in either additive networks and directed cyclic networks where both models coincide by SINGH, KHOLI. This proposed work

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Volume XIX Issue III Version I 50 Year 2 019 ( ) C provide a pseudo-polynomial time solution with nonnegative costs and gains. In networks with losses and gains there are two versions: a flow model and a path model. The shortest path problem is solvable in pseudo-polynomial time for nonnegative costs and gains by a dynamic programming approach. These N P-hardness results hold for the out-flow from the source, even for networks with integral capacities and with unit gain or with loss two for each arc, and for the in-flow into the sink, even for networks with unit loss or with unit gain for each arc. Moreover, the maximum flow problem is MAX-SNP-hard, and is hard to approximate. On the contrary, in unit-loss networks the maximum flow problem from the source can be solved efficiently by the Edmonds-Karp algorithm in O(nm2). Results reveal an essential difference between networks with additive and with (or without) multiplicative losses and gains. From the algorithmic point additive networks are much harder. Here the common flow problems are intractable whereas they are tractable in generalized networks with multiplicative losses and gains and in standard networks. The computation of the maximal flow in N from s to t uses the Edmonds-karp algorithm. This computes the flow augmenting paths according to their lngths, the length in sence number of arcs. Edmonds-Karp algorithm computes a maximal flow, and the flow is integral at every arc. [1] [2]

Figure 1:

[1] © 2019 Global JournalsAlgorithm and Design Techniques -A Survey

[2] ( ) C © 2019 Global Journals Algorithm and Design Techniques -A Survey

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