International Journal of Recent Technology and Engineering (IJRTE)
ISSN: 2277-3878, Volume-8 Issue-4, November 2019

Sky-A* Algorithm for Artificial Intelligence

Mohd. Junedul Haque, Rakesh Ahuja

Abstract*: We have discussed variant of informed search in this paper like A* search. The informed search algorithm is developed to run in given limited memory by use of heuristic knowledge with retraction methods. We introduce the sky-A* algorithm for solving shortest path between two nodes. The sky-A* algorithm developed a logic by which the obligatory nodes like A* can extend and return the optimal result joining the nodes. In addition, the method sky-A* is guaranteed to return an optimal path when heuristic information used. We present a number of different methods for both low and high level procedures and analysis their results and performance. Proposed algorithm provides accurate combination of surroundings of video segments in situations when camera movements are complex.

Keywords: **Nodes, Algorithms, Heuristic, State, Real Time Strategy (RTS), Segmentation, Restoration.**

I. INTRODUCTION

We indicate the problem of detecting shortest path between two nodes. Problem such as computing a traveling salesman tour, chess, solving the tower of Hanoi problem etc. can be solved by examining the nodes in a large search space.

Heuristic search focuses on using information about problem to guide the search. In large number of board positions that need to be searched and create "embarrassingly" problem.

The main focus in this paper is to evaluate relative advantage of a spectrum of belief space planning heuristic in a normalized setting and compare of best heuristic form this work to present state of the sky-A* algorithm. These are the following three classes into which Graph in search problems can be divided:-

A. Well known graphs

The graph will be well known if all the edges and nodes of a graph are present in system. The adjacency matrix that represents the complete graphs will be the input for such problems.

B. Large graphs

In search problems many graphs have an exponential number of nodes. We create the nodes in A* algorithm when they are necessary and set the proper reference in the data storage techniques like, array. Generating entire nodes in advance is misuse of space if you are not going to deal with most of them for small graphs.

It still takes up lot of memory space for too large graphs.

C. Tile based graph

The form of two dimensional isometric graphs that is called tile based graph has disappeared from main streams of the games. In Large number of games grids are used in which they apply their own 3-Dimensional models. Title based graphs can be formed by these. Tile based graphs are broadly used by most of the games that is real time strategy based. Graphs on terrain and height data are still used outdoor games.

II. PROPOSED SKY-A* ALGORITHM

In A* algorithm, In order to achieve the significant data linked with the problem first node should be traversed first by the algorithm. The sky-A* algorithm Acts essentially like a regular A* search algorithm. The algorithm Select at each cycle a node from the database for the expansion, like A* algorithm.

Euclidean distance between target node and n is the heuristic function h(n). If the node selected with maximum optimal value has not been examined by the agent but the node with minimum optimal value is activated the SKY- A* algorithm and after evaluation explore it. The algorithm contains two heuristic functions as listed below:

A. High value heuristic function

B. Low value heuristic function

If a mode has been explored with low value heuristic function it is extendible by the maximum value heuristic function.

If node already traversed then it is easily extendable by the maximum value heuristic function without the requirement of to use the algorithm to traverse that unique node. The steps of high level heuristic function are: These heuristic will be suitable for heuristic function h(n) of SKY-A* algorithm.

Minimum value heuristic function might further move ahead not compulsorily to the target node, but to a distinct node that is near to the current situation of the agent.

When low value heuristic to the target node, instead of a selecting distinct node from the available list which is closer to the algorithm's exact location, the algorithm may take decision first to traverse the closer node and the entire process might choose to avoid the target node in the "open" list and choose it. Based on all the above discussion we decided to follow with our proposed two heuristic function h(n) of SKY-A* Algorithm.

Manuscript published on November 30, 2019.
* Correspondence Author
Mohd. Junedul Haque*, CUIET, Chitkara University, Punjab, India. Email: junedul.haque@chitkara.edu.in
Rakesh Ahuja*, CUIET, Chitkara University, Punjab, India. Email:rakesh.ahuja@chitkara.edu.in

1. *create a list "open"*
2. *If list is empty, return failure and exit. Otherwise,*
3. *Select best node from list open (by Apply any informed search technique) and make it as current node.*
4. *If current node is not explored, then explore the current node.*
5. *Go to step no 2.*

III. RESULT AND DISCUSSION

Performance analysis of SKY-A* can be measured on the basis of cost of returned path, possible path and real visited path. Any algorithm that returns the optimal solution must explore at least every nodes that are explored by A* Algorithm.

The result of SKY-A* algorithm can also obtain for other types of graphs. Algorithms also contain a cost function that combines both time consumption and optimal cost. The analysis show that for each combination there exist an minimal number of nodes which are responsible to boost as cost boost.

First of all this method searches the upper region of frames for sky. Then it searches the neighboring pixels if a pixel color resembles with specified norms. The algorithm stops searching if difference between neighbor pixels colors is bigger than a constant threshold and the next pixel doesn't follows the color norms.

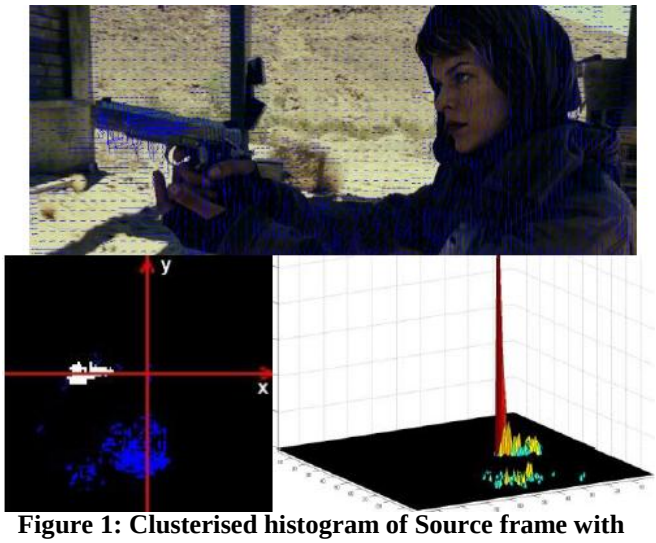

Figure 1: Clusterised histogram of Source frame with motion vectors, 3D-visualisation (right) and Orthogonal projection (left)

Figure 2: Result of proposed algorithm

The algorithm SKY-A* is created to traverse the set of predefined nodes as effectively as possible. On the based of the property of A* algorithm and design of SKY-* algorithm, we have argued that SKY-A* algorithm return a path that is optimal or best for future executions. Our study and analysis demonstrate, nevertheless, that actual cost of SKY-A* algorithm in the same manner of optimal cost computed without a line. The example of obtained sky mask is shown in Figure 2.

The given problem solved by SKY-A* algorithm using method of splitting the standard node expansion stage into two phases. First expanding a node means visiting the node, generating all its nearest nodes includes them to the open list. Second, closing a node means delete it from the open list and push it into closed list.

Process accomplished only when all the nodes of smaller 'f' node value has been examined. In order to improve the efficiency of the SKY-A* algorithm and make the overall work distribution more balanced. Using our proposed algorithm allocation procedure, all paths from these initial states are visited in Breadth First Search manner.

The inspection of the proposed algorithm has been made on segments of different movies as shown in Figure 3 and 4.

Figure 3: Original sequence frames and panorama based frame

Retrieval Number: D7470118419/2019©BEIESP
DOI:10.35940/ijrte.D7470.118419
Journal Website: www.ijrte.org

Published By:
Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP)

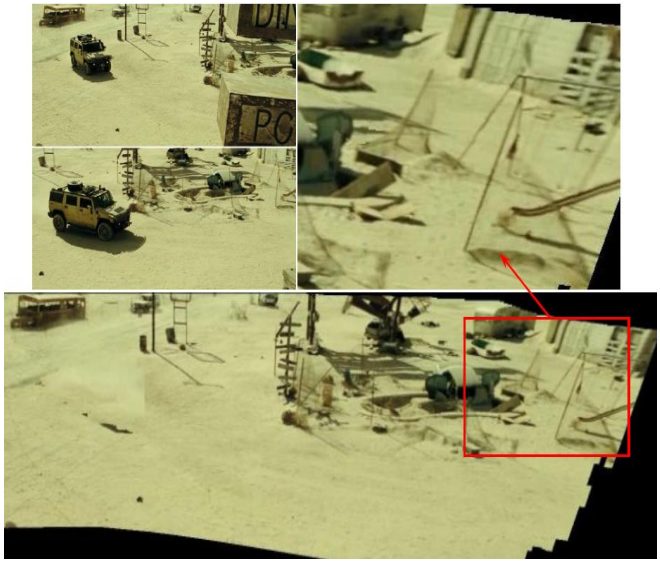

Figure 4: Test result on fragments of different movies

IV. CONCLUSION

We have presented the low level algorithm SKYA* with the intelligent heuristic knowledge for such surroundings atmosphere for a single agent and further with multiple agents. Proposed method provides quick way of generating background mosaic for any input videos. We have discussed with several variations of search graphs with different nodes. We have proposed two algorithms for combining time utilization and utility of intelligent heuristic. Also we have explained a cost function that combines both heuristic utilizations and time.

REFERENCES

1. Jagdish Prasad,A.K. Bhardwaj,Surendra Kumar Yadav, “The Maxmin Minmax Algorithm For Game Playing” Advances in Information Theory and Operations Research (2010),pp.304-311, Om Parkash, VDM Verlag (Germany).
2. Dechter R. and Pearl J., Generalized Best-First Search Strategies and the Optimality of A*, JACM, Vol. 32 (3), July 1985, pp. 505-536.
3. A. Mahanti, D. S. Nau, S. Ghosh, A. K. Pal, and L. N. Kanal. Performance of limited-memory heuristic search algorithms for networks: A theoretical and empirical analysis.1991. Submitted for journal publication.
4. Manzini, G. and Somalvico, M. Probabilistic Performance Analysis of Heuristic Search Using Parallel Hash Tables, submitted to Annals of Mathematics and Artificial Intelligence.
5. Ariel Felner, Roni Stern,Asaph Kraus,Nathan Netanyahu” PHA* Finding the Shortest Path with in An Unknown Physical Environment ligence” Journal of Artificial Intelligence Research .
6. H. S. Stone and J. M. Stone. E.cient search techniques: An empirical study of the n-queens problem. Technical Report Tech. Rept. RC 12057 (54343).
7. R. J. Walker. Combinatorial Analysis (Proceedings of Symposia in Applied Mathematics, Vol. X), chapter An enumerative technique for a class of com-binatorial problems, pages 91{94. American Mathematical Society, 1960.

AUTHORS PROFILE

Dr. Mohd. Junedul Haque is Ph.D. in Computer Science and Engineering. He is having 8 years of experience in Academic, Research and Industries. at UG and PG levels of Computer Science & Engineering. His areas of interests are image processing, data warehousing, data mining and multimedia technology, computer networks. The author has published four books and many research papers in distinctive national/international journals, conferences.

Dr. Rakesh Ahuja is PhD in Computer Science & Engineering. He is having 24 years of experience in Academic, Research and Industries. His areas of expertise are Information Hiding, Digital Right Management, Multimedia Security and Pattern Recognition. His areas of interest include Database Management System, Real Time System, Distributed System, Software Engineering and Operating System. He has supervised several ME Scholars in the areas of Information Hiding.