A SURVEY OF PRIM'S ALGORITHM

Rushita Acharya[1], Harekrushna Dobaria[2], Hemadri Martand[3]

[1,2,3]Neon Technology, Ahmadabad

Abstract: This survey paper describe how prim's algorithm can be used in different areas. This paper is based on prim's algorithm which can be used the graph theory, minimum spanning tree concept.We obtain prim's algorithm as better to the other algorithm. Prim's algorithm used in image segmentation, divide the image in small pixel and pixel can be consider as node for the graph. We also describe that how can we apply prims in power system reconfiguration and how can is used in design of GPU based system. We can used prim's algorithm in generic area that also describe.
Keywords: Prim Algorithm, Greedy, Shortest Path, Routing

I.   INTRODUCTION

Prim is a greedy algorithm that solves the MST problem for a connected and weighted undirected graph. A minimum spanning tree is a set of edges that connect every vertex contained in the original graph, such that the total weight of the edges in the tree is minimized. The algorithm starts at a random node of the graph and, in each iteration, examines all available edges from visited to non-visited nodes in order to choose the one with the lowest cost. The destination of the chosen edge is then added to the visited nodes set and the edge added to the MST.[6,7]
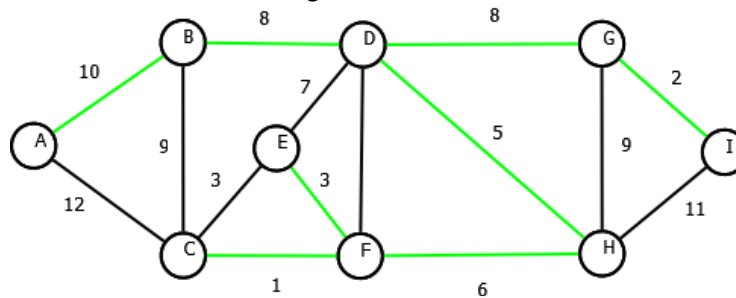
II.   PRIM'S ALGORITHM APPLYING IN DIFFERENT AREAS

[1]Image Segmentation by Construction of Shortest Spanning Tree Using Prim's Algorithm.
Applying prim's algorithm in image segmentation In Image segmentation we divide the image regions into a number of regions based upon certain characteristics like intensity values etc. Image segmentation is to classify or cluster an image into several parts (regions) according to the feature of image, for example, the pixel value or the frequency response.One of the advantages of using graph is that the connectivity information of graphs allows independent work to be performed on different parts of the original image, and allows one to reconnect them to yield an accurate result as if processing had occurred globally.The minimum edge in the graph is removed and continuously added to the spanning tree till all the edges connect two vertices in the graph and all the vertices in the original graph is connected in the spanning tree.Use of prims algorithm for solving image segmentation and edge detection problems. We will be seconding our proposition with the help of mathematical models and simulations.[1]

[2]Power system reconfiguration based on prim's algorithm.
Distribution system is the network which transfers the power from the transmission lines to the load centers.The distribution network consisting of feeders(transformers), loads, lines and protective

devices is generally built as interconnected mesh network and the system is divided in to subsystem the main aim was to find the best path for the power to flow and to obtain this optimal path the concept of graph theory was also used.Application in the paper presents an algorithm for finding the shortest path for power routing between two nodes in an electrical network used in the airlines. Presents MST for network topological observability analysis with application of the MST for finding the connectivity in the VLSI circuits the minimization of energy losses in distribution systems by applying a general search method to a Brazil power network has been presented.

[3]Design and Implementation of GPU-Based Prim's Algorithm
Proposes a minimum spanning tree algorithm using Prim's approach on NVidia GPU under CUDA architecture. By using new developed GPU-based Min-Reduction data parallel primitive in the key step of the algorithm, higher efficiency is achieved. Experimental results show that we obtain about 2 times speedup on NVidia GTX260 GPU over the CPU implementation and 3 times speedup over non-primitives GPU implementation. The serial computational complexity of Prim's algorithm implemented with traditional data structure is O ($|V|$2). Research of Prim's algorithm concentrates on its serial version. There have been several parallel formulations of Prim's algorithm.

[4]Prime Object Proposals with Randomized Prim's Algorithm
Generic object detection is a recent development of computer vision research that has received a fast-growing interest.The *RandomizedPrim's* (RP) algorithm, is designed to sample random partialspanning trees of a graph with large expected sum ofedge weights. This is done by (i) replacing the greedy selectionof edges in Prim's algorithm with multinomial samplingproportional to edge weights, and (ii) using a randomizedtermination criterion to avoid covering the full graph we apply RP on the graph induced by the super pixels of an image, with edge weights representing the likelihood that two neighboring super pixels belong to the same object. Based on a training set, we use logistic regression to discriminatively learn these weights as a linear combination of several super pixel similarities. When the randomized stopping criterion of RP is met, we generate an object proposal using the bounding box of the super pixels spanned by the current tree .advantages super pixel boundaries yield proposals that tightly fit objects (ii) randomization increases the diversity of our proposals and (iii) RP is very efficient, leading to a very fast object proposal method.

III. CONCLUSION

Prim's algorithm described in this paper various areas has applied prim's algorithm for the best solution of a problem. Importance of prim's algorithm in imagesegmentation in case of larger images. Prims, being a vertex centric algorithm take much less time and resource than any other technique.by the prim's algorithm in power system we improve The power losses of distribution systems can be effectively reduced by proper feeder reconfiguration. In addition to power–loss reduction, the voltage profile can also be improved by the proposed method.we implement Prim's algorithm using new developed Min-Reduction data parallel primitive under CUDA architecture on GPU to solve MST problem by the graph theory and computing geometry on GPU is helpful to achieve performance improvement.by prim's algorithm in genetic object we improving the significantly faster and significantly more accurately.in this paper we conclude that using prim's algorithm we can define and improve the result of output in various area field.

REFERENCES
1. S Sibi, SwarnaPriya R.M., Pranov Kumar, Raghavendra Singh, AnithaBaskar –Image segmentation IEEE journal
2. Santiago Manenl, MatthieuGuillauminl,Luc Van Gool-randomize prim's algorithm
3. P. Felzenszwalb, D. Huttenlocher: Efficient Graph-Based Image Segmentation

4. Cheriton, D., and Tarjan, R.E.: 'Finding minimum spanning trees', SI AM J. Comput., 1976, 5, pp. 724-42

5. Ali Shatnawi, M O Ahmad & M N Swamy, "Scheduling of DSP data flow graphs onto multiprocessor for maximum throughput", IEEE 1999, pp 386 – 389

6. Cavellucci&Lyra, "Minimization of energy losses in electric power distribution system by intelligent search strategies", International transaction in operational research, vol. 4, no. 1, 1997, pp 23 – 33

7. S Sivanagaraju, T Ramana, "A simple graphical method for feeder reconfiguration and service restoration of distribution networks," Electric power components and systems, 32:883 – 892. 2004