An Improved Algorithm for Finding All Pair Shortest Path

Authors:
Himanshu Garg
Paramjeet Rawat

Abstract

Floyd Warshall’s Algorithm is a simple and widely used algorithm to compute shortest path between all pairs of vertices in an edge weighted directed graph. It can also be used to detect the presence of negative cycles. Many researchers have given many other approaches for finding all pair shortest path but they reduced the complexity by using complex data structures. In this paper, we suggest a technique for finding shortest path based on Floyd Warshall’s algorithm with reduced time complexity and also by not using complex data structures. We present an $O(n^3)$ time algorithm for finding all pair shortest paths. Our proposed algorithm is an improvement on the previous algorithm whose best result was $O(n^3)$.

References

An Improved Algorithm for Finding All Pair Shortest Path

- Yijie Han, "An $O(n \log \log n \log n)$ time algorithm for all pairs shortest paths"; Manuscript, 2009.
- Yijie Han, "An $O(n (\log \log n / \log n))$ time algorithm for all pairs shortest paths"; Algorithmica, 51:428–434, 2008.
- Yijie Han, "A note of an $O(n / \log n)$ time algorithm for all pairs shortest paths"; Information Processing Letters, 105:114–116, 2008.

Index Terms

Computer Science

Pxc3880492
Keywords
Shortest Paths  Floyd-warshall Algorithm  Complexity.