1096-68-283 **Sharareh Alipour*** (sharareh.alipour@gmail.com). *Approximation algorithm for the visibility counting problem using randomized method.*

For a set of n disjoint line segments S in R^2, the visibility counting problem,VCP, is to preprocess S such that the number of visible segments in S from a query point p can be computed quickly. This problem can be solved in logarithmic query time by using $O(n^4)$ preprocessing time and space.

Here, we approximately solve this problem using a randomized algorithm with tradeoff between space and query time. In the query time, we have 2 phases; In the first phase, we find the exact answer of VCP for the query which sees at most n^β of the segments and in the second phase, we approximate the number of visible segments for the query which sees more than n^β of the segments. The preprocessing time of our algorithm is $O\epsilon(n^{(4-3\beta)})$ and the query time is $O\epsilon(n^\beta)$ where $O\epsilon(f(n)) = O(f(n)n^\epsilon)$, which is prior compare to the best known algorithm for this problem.

To improve the approximation factor, we reduce the problem to a problem in graph theory. By using Euler formula we give a better approximation factor.

We also define the problem in R^3 and give applicable algorithms. For R^3 we present the experimental results too. (Received August 26, 2013)