Abstract

Shortest path is a collection of connected edges that forms a path with shortest distance between the start and destination node in a graph that has weight on each edge, one of the example is determination of nearest route on the map. Time optimization algorithm is one of the problems that occurred in shortest path determination. On this research, the algorithm based on coding graph is applied to determine shortest path from start to destination node. Time complexity of the algorithm based on coding graph is O(n+e). The algorithm based on coding graph consist of three main stages, which are construction of orthogonal list data structure to store graph's data and the shortest path solution, construction of coding graph by tracing all the nodes to determine weight of the shortest path solution, and determination of shortest path. The writer proposed construction of coding graph with a stopped node tracing to optimize execution time. The map of Bandung City from OpenStreetMap, a system that built to implement GIS, is used as the data input. Based on the experiment conducted, the algorithm based on coding graph has better performance to determine shortest path, this proved by 100% accuracy of the solution. The algorithm based on coding graph with stopped node tracing has better performance compared to the algorithm based on coding graph that trace all the nodes. More node needs to be traced it takes longer time for the algorithm based on coding graph to determine shortest path.

Keywords: shortest path, optimization time, coding graph, orthogonal list and GIS.