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## **Ridesharing android application for traffic control**

R. B. Yeshani

Department of Statistics & Computer Science, Faculty of Science,  
University of Kelaniya, Sri Lanka  
binuri92yeshani@gmail.com

From past few years, usage of personal vehicles was highly increased and reported heavy traffic densities in urban areas. Most of the vehicles that result to increase of traffic are personal vehicles used by just one or two people inside. Ridesharing concept can therefore be used to reduce traffic in urban transportation system. Vehicle drivers can offer their free seats to passengers who want to travel in similar directions. Ridesharing concept is very effective to reduce travelling expenses, road traffic, and fuel consumption. Though the traditional ridesharing systems are suitable for long-distance travel, in most of the time, they are not flexible for short distance rides. Map route is represented as set of road segments and junctions. Driver and rider routes matching is performed using these junctions and road segment details. Ridesharing has to find matching driver and rider routes by compare each junction, road segment. Route matching for a road routes is complex and computational intensive task by comparing each node details with every other node in routes. This research applies graph theories and algorithms to simplify algorithmic complexities, reduce order of computations of the problem. Road network can be models as a graph. Open Street Maps (OSM) map data is freely available. The road network is populated into the graph database using the road details extracted from OSM map. Then all drivers' and riders' routes are populated into the graph database. Most matching route is the route pair with highest number of identical graph nodes and road segments. Graph database systems has inbuilt graph algorithm related quires to optimize the performance. Arangodb is used as graph database system. A prototype system has been built for Android Mobile phones. Android application communicates to server application runs on Google cloud, through Firebase database, which handle real-time usage and user connection management. Server application runs matching process, finds out the best matching ride according to the passenger's request. This system provides more accurate, fast, and more efficient ridesharing mobile application.

**Keywords:** Android, graph database, ridesharing