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A recommendation system in urban transportation based on ACO¹ and fuzzy logic

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Abstract

Nowadays it's a challenge for drivers to select the best route between their source and destination due to expanding road network and the variety of paths between every source and destination. The major issue in this research is the problem of selecting best route in urban road networks that depends on many parameters. Parameters such as route's length, traffic, safety, weather conditions, accommodations, road quality, etc. selection and priority of these parameters vary through human beings and conditions. Some information such as road traffic, weather conditions and accommodations can be received using maps and websites. Then by combining these information with personal knowledge and experiences, route selection can be done partly. But there's always chances of human fault in experimental ways of receiving, combining and comparison of information, so it can be led to travel problems and waste of time due to dangers of urban traveling. Plus the fact of some road parameters such as traffic being dynamic and unable to be considered easily by drivers. So it's needed to have a system to receive, combine and comprise the road data dynamically and consider the driver's personal conditions to recommend the most suitable path. Lots of solutions have been suggested to solve the routing problem, and many of these solutions like the solution suggested in current research were based on natural behaviors specially the behavior of creatures that need to find the best routes to food resources for living. But in the current research another important parameter is considered beside the travel time and it is the safety. Because of this parameter being uncertain and not having a physical identity, fuzzy calculations are used. After implementing the current solution and comparing it to a previous one, 1.3% improvement in accuracy of results has been observed.

Key words: urban routing, ant colony optimization, fuzzy logic, ITS², road's safety

¹ Ant Colony optimization

² Intelligent Transportation System