AN INTELLIGENT TRAFFIC LIGHT ALGORITHM SYSTEM

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ABSTRACT

Traffic light control systems have increased in use on our roads particularly in the urban areas. Every year, more cities are starting to implement traffic light control systems to control traffic in and out of the city. Much of this increase is due to the increasing number of motorists and pedestrians in the cities and urban areas. This study aimed at showing how Fuzzy logic can be used in the development of an intelligent traffic light control system. Traffic light control algorithm plays a vital role in enhancing control of traffic flow in the cities, however despite the fact that traffic lights have been successfully used by many cities, little has been done to establish how fuzzy logic can be used to enhance traffic light control algorithm. Building on sparse literature regarding use of fuzzy logic in traffic light control algorithm, where motorists are allowed to interact collectively and intelligently with the environment, intelligent traffic light algorithm system based on fuzzy logic concept is appropriate and suited for our roads due to its adaptive nature.

This research has adopted a cross sectional study targeting traffic control in the city of Nairobi Central Business District and its surroundings. The junctions at Railways, Haile Saleessie and General Post Office were used to collect data through observations of traffic behavior at the intersection points. Data was analyzed and presented using descriptive statistics; tables and graphs by using excel 2003. The study found out that fuzzy logic based systems performed better than conventional Fixed-time (FT) based traffic control algorithm commonly used in many cities. The research also discovered that the most outstanding benefits of fuzzy logic based traffic control systems include; It will improve traffic safety, traffic flow based on its performance assessments, also use of intelligent traffic light algorithm would increase average travel times to and from the city centre and reduce waiting times during travels across the city. In conclusion, the findings of the study highlight the importance of using fuzzy logic traffic control algorithm in traffic flow control management.