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College of Engineering

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Thalavapalayam, Karur, Tamilnadu.



SIGNS WITH SMART CONNECTIVITY FOR BETTER ROAD

SAFETY

TEAM ID:

PNT2022TMID31035

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ABSTRACT

In present System the road signs and the speed limits are static. But the road signs can be changed in some cases. We can consider some cases when there are some road diversions due to heavy traffic or due to accidents then we can change the road signs accordingly if they are digitalized. Intelligent transportation system (ITS) offers significant opportunities to save lives. A Road Safety International task force, comprising leading international experts in road safety and connected mobility, has focused on the relation between interconnected mobility and road safety. Road infrastructure has seen consistent improvement in the last few years. Connectivity has improved and road transportation has become a focus of rapid development. Roads are providing better access to services, ease of transportation and freedom of movement to people. But in metropolitan cities traffic congestion is increasing rapidly, it results in chronic situation in dense downtown areas. Traffic signals play a significant role in the urban transportation system. They control the movement of traffic on urban streets by determining the appropriate signal timing settings. Adaptive traffic signal controllers as the principle part of intelligent transportation systems has a primary role to effectively reduce traffic congestion by making a real time adaptation in response to the changing traffic network dynamics. In this paper different methods are proposed by reviewing different research papers for traffic signal control, which gives best adaptability & optimization ideas in traffic signal control.

LITERATURE REVIEW:

A recent development of Internet of things may also involve in the development of road safety signs with better features. The risks in traffic and accidents may decreased in terms of IOT. This helps the human to understand the road safety measures in a better way.

AUTHOR: Rongrong Tian, Xu Zhang

DESCRIPTION: The TRANSYT traffic modelling software to find the optimal fixed-time signal plan and VISSIM micro-simulation software to affirm and evaluate the TRANSYT model and to help assess the optimal signal plan; build an adaptive frame signal plan and refined and evaluated the plan using VISSIM with VS-PLUS emulator. Through micro-simulation, it was shown that delay in the adaptive signal control was shortened noticeably than that in the fixed time control.

AUTHOR: Gustav Nilsson

DESCRIPTION: Class of dynamic feedback traffic signal control policies that are based on a generalized proportional allocation rule. There results in a differential inclusion for which there prove existence and, in the special case of orthogonal phases, uniqueness of continuous solutions via a generalization of the reflection principle. Stability is then proved by interpreting the generalized proportional allocation controllers as minimizes of a certain entropy-like function that is then used as a Lyapunov function for the closed-loop system.

AUTHOR: Junchen Jin and Xiaoliang Ma

DESCRIPTION: A group-based signal control approach capable of making decisions based on its understanding of traffic conditions at the intersection level. The control problem is formulated using a framework of stochastic optimal control for multi-agent system in which each signal group is modelled as an intelligent agent. The proposed system is designated to be

compatible with the prevailing signal system. The parameters were off-line optimized using a genetic algorithm. Simulation results shown that the proposed adaptive group-based control system outperforms the optimized GBVA control system mainly because of that's real-time adaptive learning capacity in response to the changes in traffic demand.

AUTHOR: Nasser R. Sabar

DESCRIPTION: Controlled the movement of traffic on urban streets by determined the appropriate signal timing settings. Proposed algorithm was based on the so-called memetic algorithm that combines the strengths of the genetic algorithm and local search in an adaptive manner. In that used two important techniques for improving the performance of traditional memetic algorithms.

First, a systematic neighbourhood based simple descent algorithm was employed as a local search to effectively exploit the search space. Second, an indicator scheme was proposed to control the local search application based on the quality and diversity of the search process. The proposed algorithm was coded in

the commercial microscopic traffic simulator, AIMSUN, and tested on two different real world case studies in Brisbane, Australia, and Plock, Poland. The results demonstrated that the proposed algorithm was better than genetic algorithms and

fixed-time settings, indicated that the proposed algorithm was an effective solution method for traffic signal optimization problems.

AUTHOR: Chandrasekhar.M

DESCRIPTION: Proposed FPGA (Field Programmable Gate Array) controller based on Neuro-Fuzzy system thought provided effective solution for Traffic Control. It can used to minimize drawbacks of the conventional traffic controllers with the accuracy of provided variation in green cycle intervals based on the heavy traffic loads that changed at every lane in a four leg

intersection. Also introduced an adaptive predictive signal control system that performed real time queue length estimation and employed an efficient signal coordination algorithm with APTTCA-based system.

AUTHOR: Mohammad Aslani

DESCRIPTION: Algorithms to design adaptive traffic signal controllers called actor-critic adaptive traffic signal controllers (A-CATs controllers). Worked done rested on the integration of three threads: (a) shows performance compared of both discrete and continuous A-CATs controllers in a traffic network with recurred congestion (24-h traffic demand) in the upper downtown core of Tehran city, (b) analysed the effects of different traffic disruptions included opportunistic pedestrians crossing, parking lane, non-recurring congestion, and different levels of sensor noise on the performance of A-CATS controllers, and (c) compared the performance of different function approximators (tile coding and radial basis function) on the learning of A-CATs controllers. First an agent-based trafficsimulation of the study area was carried out. Then six different scenarios are conducted to find the best A-CATs controller that was robust enough against different traffic disruptions.

AUTHOR: Huajun Chai

DESCRIPTION: Captured the interaction between travellers' route choice and traffic signal control in a coherent framework. They tested their algorithm and control strategy by simulation in OmNet++ (A network communication simulator) and SUMO (Simulation of Urban Mobility) under several scenarios. The simulation results shown that with the proposed dynamic routing, the overall travel cost significantly decreases. It was also shown that the proposed adaptive signal control reduced the average delay effectively, as well as reduced the fluctuation of the average speed within

the whole network. author described various soft computing techniques to tackle traffic control system. Which are fuzzy approaches, neural network and genetic algorithms, ant colony algorithm, particle swarm optimization, simulation model.

AUTHOR: Ekinhan Eriskin

DESCRIPTION: A new method for designing traffic signal timing at oversaturated intersections was expressed “ the elimination pairing system” . An object function with vehicle delay and stop-start numbers has been generated. Total cost value has been calculated according to the object function. Obtained results were compared with Webster as a traditional traffic signal timing design method and Transyt 14 signal timing software. While Webster gives exaggerated results, Transyt 14 and Elimination Pairing Systems provided better results. As a result of that study, the elimination pairing system could be used for optimizing the traffic signal timings.

AUTHOR: Shailendra Tahilyani

DESCRIPTION: To developed a new lane bypass algorithm for route diversion given a result in smooth traffic flow on the urban road network. Genetic algorithms are utilized for the parameter optimization. replace existed traffic signals with a system that are monitored the traffic flow automatically in traffic signal and sensors are fixed in which so the time feed are made dynamic and automatic by processed the live detection.