Traffic Control: Use Of Virtual Traffic Light

Some Surveys has been presented in the field of Traffic control. For instance, in [1] Ferreira and d'Orey where In particular they considered intelligent transportation systems (ITS) as an optimal solution to solve the environmental problems caused due to traffic congestion. Mainly the effect of carbon dioxide emission of virtual traffic light (VTL) was evaluated in this survey. The main goal of this survey was to quantify the power of the VTL technology on CO2 emissions modification. Their evaluations was based on real cities scenario in a complex simulation framework evaluation including microscopic traffic, wireless communication, and emission models, and so the results of the evaluation was finally compared with the real physical traffic light system. The results of this survey has shown a significant improvement in the traffic flow, accidents were reduced by 30%, and CO2 emission reduction by 18%.

Warberg et al. [2], presented a comprehensive survey of adaptive traffic control with emphasis on the applied optimization methods. In which they addressed the main conflicts that defines the multi-objective traffic signal optimization problem. Where in this study, two traffic systems where proposed including the DOGS (dynamic optimization of greens co-ordination), and the PP (Phase by Phase). Results showed that , DOGS has a clear advantage in optimization since, for each cycle, the only decision to be made is whether to switch between traffic-actuated control signal plans or to change to a lower or higher capacity program .while Phase-by-Phase minimizes delay using tab search by adjusting green time proportions assigned to phases.

However, in [3] Florin and Olariu study divided the traffic light signals optimization into three categories, The first category involves the methodologies that make use of legacy devices with no vehicular involvement. The second category includes the strategies that employ vehicles on the road to wirelessly transmit data about themselves (e.g. location, velocity). The third category includes strategies that use the vehicles' on-board computation power to help optimize traffic signals. Throughout the paper the advantages and disadvantages of each category was discussed and evaluated where the writers concluded that strategies that utilize the on-board compute power of the vehicles on road that are yet as widespread but are gaining be the upcoming trend as these vehicles will be outfitted with more sensors and compute more power to handle the data collected by these sensors.

Li Li in [4] conducted a survey that aimed to focused on the control side of the traffic lights system and highlighted from a philosophic point of view of the design of the traffic control that is undergoing a transition from feedback character to feedforward character. Throughout the paper different contrasting preferences are being discussed. Potentials and drawback of the following models is being addressed including model-based predictive control versus simulation-based predictive control, global planning-based control versus local self-organization-based control, and control using rich information that may be highly redundant versus control using concise information that is necessary. The writers concluded in this survey that the potential benefit of the intelligent vehicle coordination in general cannot dramatically eliminate traffic congestion when all the roads are crowded. The estimation of performance limits needs further investigations, and that the failure of any component in this integrated system will result in performance degradation or even severe traffic accidents.