Gather literature on industrial control and traffic sensors in order to identify ...

War, Intelligence

1. 0INTRODUCTION

1. 1Purpose

This write up is a proposal for a research-based engineering report on Industrial Control and Traffic Sensors, in partial fulfillment of the requirements of the course EGR 3550 titled Technical Communication for Engineers and Scientists.

1. 2Background

The continuous surge in the level of congestion of vehicular traffic on roads is a major problem being experienced in many urban centers with high population density. In 2007, the report as provided by the traffic engineering department of Jordan estimated the total cost of congestion to be 150 million US dollars (Greater Amman Munincipality, 2007). This statistic shows the enormity of the problem of vehicular traffic congestion in urban areas. Many techniques have been deployed in tackling this problem posed by traffic congestion. Some of these techniques include passive infrared, microwave radar, video processing sensors, intrusive and non-intrusive techniques etc and have high cost of setup and performance affected by weather (The Vehicle Detector Clearinghouse, 2000). The intrusive and non-intrusive sensors for instance use pneumatic road tubes with video cameras, micro-loop probes and inductive loop detectors in order to efficiently manage the roads. The intrusive sensors however are very costly to set up and maintain while the non-intrusive sensors are affected by weather conditions asides high power consumption. This also results in degraded traffic control efficiency.

Figure 1: Smart Sensor Node Design (Harish Ramamurthy et al., 2007)

1. 3Scope

In solving the problem of traffic control, a number of techniques are employed - both automated and non-automated techniques. My focus on this project will however be on the automated traffic control using intelligent controllers based on wireless traffic sensors. The other types of sensors will not be considered for the research.

2. 0DISCUSSION

2. 1Approach

The approach I will use in presenting this report on the state-of-the-art of traffic sensors and industrial controlwill entail a very brief introduction to what control systems are, especially in industrial context. I will then proceed to present a justification for the need of a control system in traffic management as the need become more apparent in urban areas. Furthermore, the kinds and types of control systems currently employed in managing and controlling traffic will be discussed. Wireless sensors as applied in modern intelligent control systems in order to overcome the challenges of other systems will be the major focus of my report. Finally, through a comparative analysis, I will evaluate the performance of the intelligent traffic sensors as compared with other forms of traffic control.

2. 2Result

My final report will be a 12-page state-of-the-art report on the use of traffic sensors for management of vehicular traffic as a form of industrial control system. The report will present information on the architecture, the

technology and the algorithms involved in the control circuit of the control system. The completion of the report will have also partially fulfilled the requirements of the course on Technical Communication for Scientists and Engineers - EGR 3350.

2. 3Statement of Work

In order to turn in the final report, the tasks to be achieved towards completion of the final report are broken down as follows;

Write an annotated bibliography of the useful literature

Interview professor experienced in traffic engineering to obtain deeper knowledge on applications of traffic sensor.

Study vehicular traffic pattern, density and traffic management techniques especially at major road intersections at locations nearby

Write the body of the report based on knowledge gathered from literature and first hand information.

Deliver a presentation in class at a specified time.

Submit a formal report of the research

3. 0RESOURCES

3. 1Personnel

I will conduct the research on this report alone. [tell a little more about yourself here stating your academic accomplishments]. I can also easily access professors with knowledge in traffic engineering in order to enrich my knowledge of the subject.

3. 2Facilities and Equipment

The university has a library with online access for the purpose of conducting

research. Similarly, the university provides computer labs with a high-speed internet access to also conduct online research and printers for printing materials. I also have a personal computer with internet access to complement the facilities available in the university.

4. 0COSTS

4. 1Fiscal

According to the estimates provided in section 2. 3 under the title statement of work, a total of 21 hours is expected to complete the project. The estimated distance of travel to the sites where I will survey the vehicular traffic volume and the traffic management techniques is 7. 5 miles. The lab fee for the use of the university computer labs with high-speed internet and printing facilities is $150 per semester while the cost of the course Technical Communication for Scientists and Engineers - EGR 3350 is the tuition for three credit hours. The labor wage per hour used is $80. The estimated cost of the project is as presented in Table 4. 1.

This project will be carried out in the last four weeks of the semester with the expected deliverable on completion as stated in section 2. 2 of this proposal. The presentation of the final report shall be done at the time set by the course instructor while the report submission proper will be done at [state the submission time for the final report here].

5. 0CONCLUSION

5. 1Summary

Industrial control systems still remain very useful in the task of controlling the output of processes to meet the target output through a feedback

mechanism. For urban areas with the attendant problems of very high vehicular traffic volumes and the difficulties in efficiently managing the flow of traffic especially at road intersections, there is the need to devise efficient and effective means to manage the flow of traffic. The use of traffic sensors as a means of intelligent control of vehicular traffic promises to be efficient and at the same time effective in reducing the average wait times and queue length of vehicular traffic at road intersections.

While partially fulfilling the requirements of the course Technical Communication for Scientists and Engineers - EGR 3350, the approval of this proposal will also give me insightful knowledge into the architecture, algorithms and technologies involved in building and deploying a traffic sensor as an industrial control system.

5. 2Contact

Please do not hesitate to contact me to obtain more information on this report.

[your name is to be written here]

[write your email address here]

5. 3Sources used

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