Review of Project Proposal for Group 9

Title of Paper: *A Critical-Time-Point Approach to All-start-time Lagrangian Shortest Paths*

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Reviewed by: G10

**SUMMARY:** The paper discusses the idea of finding the shortest path in a road network where the edge weights are dynamic in nature (change with the time). An A* based approach is used for solving this problem. An assumption is made where the edge weights change at discrete time units. With a user specified source and destination and the time-interval of the travel the algorithm attempts to find a shortest paths for discrete start times in that interval.

**FOCUS:**

1. **Does the paper clearly identify the problem it is addressing?**
   Yes, the problem is pretty explained clearly. The input/output and the limitations are clearly mentioned.

2. **Does the paper clearly explain related work and their limitations?**
   The related work and their limitations are clearly mentioned. The shortcomings of the present models are well addressed.

3. **Does the paper identify its key contributions?**
   The author presented the idea in his previous paper. The present paper is an addendum to the idea presented. The contribution of the paper is clearly discussed. The real life motivation and the practical standpoint view of the problem make the contribution stronger.

4. **Does the paper presents any evidence to support the contribution claim?**
   The paper gives evidence to the contribution claim. The paper discusses the work of implementing the A* approach in future and also comparing the CTAS, CTAS* and FIFO based approaches proposed previously.
TECHNICAL EVALUATION:

1. Is the literature survey complete?
The literature survey is good.

2. Is the work novel relative to the literature? Explain.
The ideal of using critical-time points for solving the problem is novel. The general idea is already presented by the author in SSTD 2011. The idea of using A* can also be considered novel.

3. As a reviewer do you agree with the contribution claims? Explain.
The contribution claims seems reasonable. But can be agreed completely once the experimental results are validated.

READABILITY AND ORGANIZATION:

1) Is the paper easy to read and understand to students in this course (Csci 8715)?
The paper talks about few algorithms. A basic knowledge of discrete mathematics is required to understand and appreciate the problem. People with a completely different background may not be able to understand the solution clearly. But given the nature of the problem the paper does a good work in making it simple.

2) Is the paper self-contained?
Yes.

3) Is the paper length reasonable?
It could be shortened a little. Some of the discussions can be made to the point considering the paper is about 22 page long.

4) Does it include sufficient number of figures and tables?
Excellent illustration with figures has been mentioned. The figures mentioned are sufficient

STRENGTHS:

What are the strengths of this paper?
The strengths of the paper are
1) Its practical application in the real world.
2) Considering critical time points.
3) If experimental results validate the claim the implementation of A* can also be considered as a strength.

**AREAS FOR IMPROVEMENT:**

How can this paper be improved? If you were to rewrite this paper, what revisions would you consider?

The paper itself is an improvement to the author’s previous work.

- The extension of critical-time point approaches to other time-varying problems in different domains can be looked at.
- Modeling the solution in such a way that given a day finding the time interval that gives the least travel time for a given source and destination can be done.
- User preference can be considered. Provision for user to give a particular road (edge in this case) he wants to avoid.
- Modeling the same for multi-model transport can be done. For a course project multi-model transport can be huge task. Hence a discussion in future work or in application of the algorithm can be done.