CSIE 5452, Fall 2018 — Final Project Proposal

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1 Members

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2 Type

Type	Survey	Implementation	Research
Estimated Percentage	20%	40%	40%

3 Title

Pedestrian-focused autonomous intersection management

4 Problem Description

Attempt to devise an effective and efficient framework to incorporate pedestrain into autonomous intersection management.

5 Reason to select the problem

According to survey, there are currently no existing autonomous intersection management framework that considers the priority of pedestrain. However, the time for pedestrains to wait at a crossroad should not be neglected as it inflicts no less social cost compared with automobiles. Thus, a method to prioritized the pedestrians crossing intersections while minimizing the negative effect on traffic flow is an urgent demand.

6 Rough Schedule

- Nov, 18: Complete survey with full knowledge of state-of-the-art autonomous intersection management methods. Implement rudimentary model and experiment with toy dataset.
- Dec, 18: Obtain real world data to experimant and revise the model accordingly.

- Jan, 19: Complete the remaining pieces of the framework. Prepare for report.

7 Expected Results

We expect to propose a novel method to incorporate pedestrains into the autonomous intersection management framework. It should be able to be theoretically provable better than conventional methods (worse case analysis) and follow the same trend in simulation as well. We plan to eveluate the feasibility of implementing it in real life situations.

8 Any Double Assignment

None.

9 Any Completed Work

None.

10 Optional Questions

- What are the references that you want to survey?
  Journal and paper related to autonomous intersection management on Google Scholar.
- How do you plan to survey the references (detailed or quick)?
  We plan to first go through the abstract and introduction of each paper and journal then dive deep into the more relevant ones.
- Is there any existing public implementation?
- How to you get the input data?
- What language do you want to use?
  Python.
- What are the references that you want to consider or compare with?
  We will build our model on top of the legacy by K. Dresner and P. Stone et al. (2008) and compare with the original version as baseline performance evalutation. Upon further maturity of the new model, we can compare with more advanced models such as the multi-intersection optimized model proposed by M Hausknecht et al.. Alternative benchmarking can be done by comparing with other groups participating in this course with similar project topic.
- What are the possible directions that you can get improvement over existing work?
  - Incorporate pedestrians into autonomous intersection management
  - Utilize pedestrains to improve the autonomous intersection managing experience
  - Possibly incorporate bicycles or anything traveling with different speed than automobiles
  - Propose solution to multiple targets with largely varying speed sharing the same route