

EE126 Project Proposal

Zhongxia Yan, Eli Dykaar, Ankit Mathur

Our idea is to use the Pagerank algorithm on a map dataset in order to analyze the choke points and potentially compute other interesting data about traffic flow from our simulation via Pagerank. We feel that we can do a lot of things with the transition probabilities in this map Markov Chain that will allow us to simulate a variety of factors, including traffic during different times of the day, the impact of population density on a specific region, etc. In particular, if we are able to find what the choke points are, given some specific conditions that we can model in the transition probabilities, we can also model the addition of infrastructure in some specific areas (by altering the probabilities) and run the simulation again, to see whether the new system does not have a choke point at that area. Ultimately, we feel that there is a lot of flexibility with what we can analyze. The dataset we plan on using is a map model of a major city like San Francisco or New York. Though we do not have a direct map that represents these cities in graph form, we are confident that we can use a variety of APIs/other sources to populate a pared down version of such a map that would be enough to provide us with interesting insights.

We plan on applying PageRank by modeling drivers as random drivers subject to the transition probabilities within the map model, which is our version of the Markov chain/states. We have not yet decided what each state node is, though we can have a node at any arbitrary density within a road to model choke points as specifically as possible. We expect to see that choke points will exist in places where we have high transition probabilities but a low “capacity” model (internal roads near sports arenas/businesses). We also suspect adding infrastructure directly at a choke point might not alleviate the choke point entirely – it might just shift it.