

REU Week 8



DAVID JENSEN

JULY 9, 2010

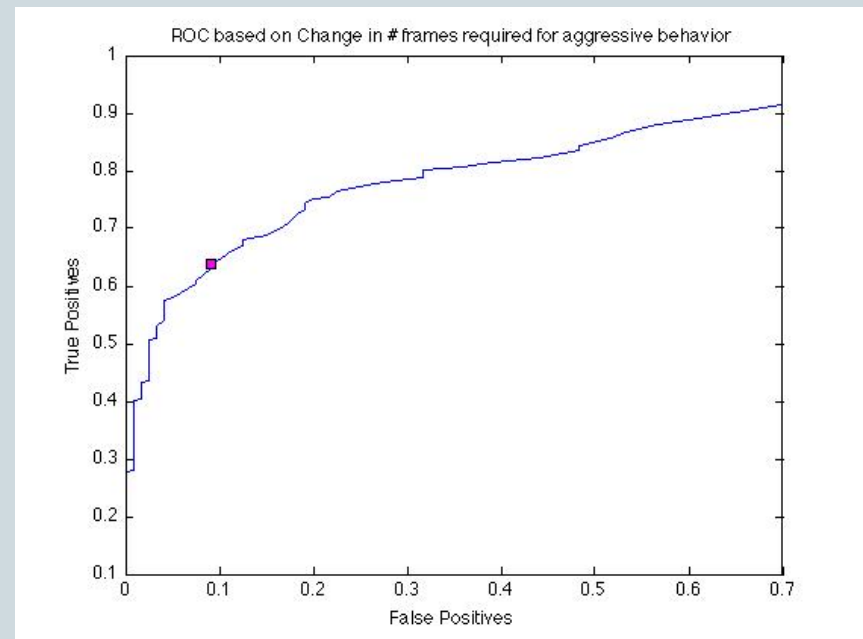
Current Progress



- Decided that the previous data set (Lankershim Blvd) was not very good and the ground truth data was inaccurate
- Using the Intelligent Driver Model, we could detect about 64% of aggressive vehicles with a false positive rate of about 9%
- Got a new data set from NGSIM for US 101 in Los Angeles
- Initial results look good...

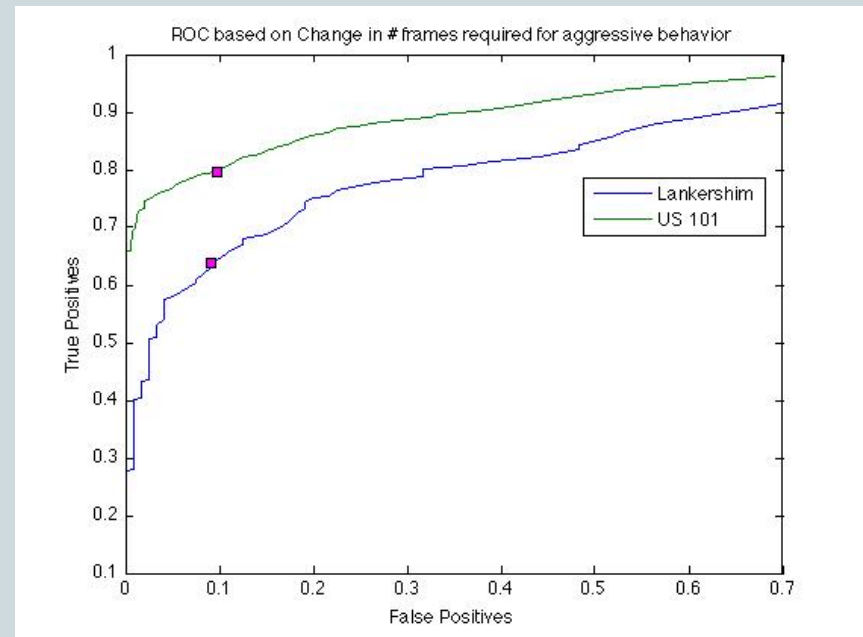
Lankershim Blvd Results

- Standard values of the IDM parameters are used
- Cutoff of 30 frames:
 - 63.91% detection rate
 - 9.17% false positives



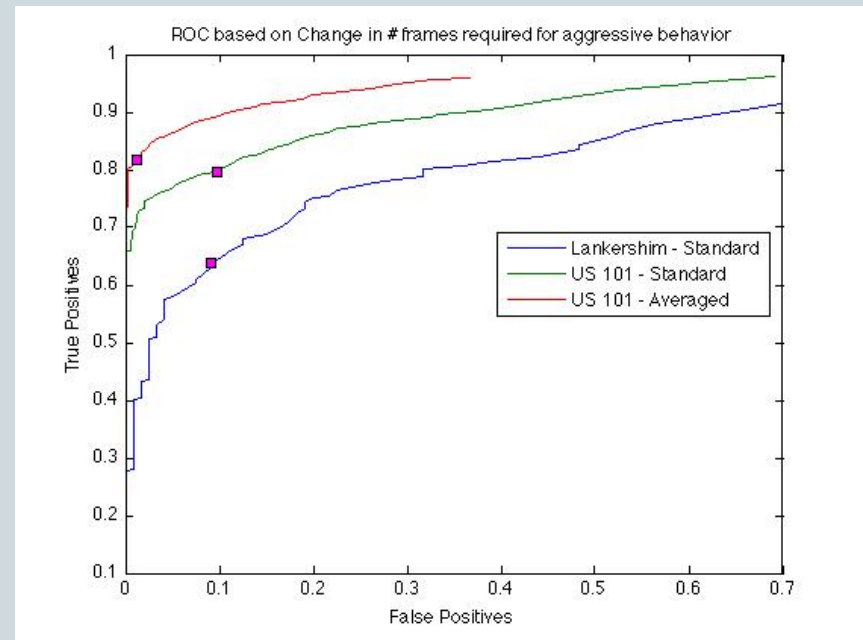
US 101 (new data set) Results

- Standard values for the IDM parameters
- With a cutoff of 30 frames
 - 79.64% detection rate
 - 9.73% false positives
- About 15% more detections



More US 101 Results

- Parameters 'a' and 'b' derived based on the average acceleration/ deceleration of vehicles over time
- Cutoff of 30 frames
 - 81.68% detection rate
 - 1.22% false positives



Working on



- The parameter 'T' designates a safe following time (recall the 3-second rule)
- High numbers of vehicles are tailgating based on 'T'
 - T = 2, 80% of vehicles
 - T = 1, 33% of vehicles
- This demonstrates a disparity between what we consider 'safe' and what the rules of the road consider 'safe'
- So far, the IDM has been compared for each individual vehicle
- Would like to explore looking at how well the traffic patterns match at a larger scale

Using this Equation

$$Y_{\text{emp}}(x,t) = \frac{1}{N} \sum_{x_i} \sum_{t_j} Y(x_i, t_j) \exp\left(-\frac{(x-x_i)^2}{2\sigma_x^2} - \frac{(t-t_j)^2}{2\sigma_t^2}\right).$$

To get something like this

