Name :- Shreyas Srinivasa
ID Number :- 01255187

Proof of Innocence Summary

The entire proof of innocence is based on the scientific theory that when an observer visually measures the speed of any object that passes him, he can only measure its angular velocity and not its linear velocity. The proof of innocence is divided into three sections. The first section develops a relation between linear and angular speed. The second section simulates the real life situation by taking the deceleration and acceleration of the car as constant after it stops directly in front of the observer. The last section explains what happens when the observer's view is obstructed by a foreign object in addition to all the factors and variables introduced in the previous two sections.

In the first section angular velocity as a function of time is derived if the car moves at a constant linear speed. The graph is plotted with reasonable values and it theoretically proves that the visual angular speed of the car is not constant when it is moving with a constant linear speed. It increases and reaches its maximum value when it enters the linear trajectory of the observer. Therefore the car will appear to speed up from the perspective of the observer when it passes the stop sign.

Section two integrates expressions of constant acceleration and deceleration into the function of angular speed already derived in the first section. Ideally, the angular speed of the car must drop to zero when the car stops at the sign. However, on plotting the function on another graph it is clearly observed that it mimicks the first graph

if the constant values of acceleration and deceleration assumed in the visulization are increased. The narrow region at t=0 always remains in every situation as the angular speed of the car must drop to zero as it stops at the sign. The slope of the maximums is directly proportional to the acceleration and deceleration values.

In the third section, the defendant adds in an external factor which is another car that had obstructed the view of the observer during the actual incident. He classifies the obstructions into two types:- partial and complete obstructions. He makes the assumption that the acceleration and deceleration values are as close as possible to the normal values of a car, when it is braked very hard, as he claims to have done so during the incident as he was down with a severe cold. After obtaining the duration of the partial and full obstructions, he calculates the time at which the car will have maximum angular speed as perceived by the observer without any obstruction as shown in the section two graph. It is proven that the time lies between the time of partial and full obstructions and the difference between the times are very small. Therefore it is possible for the observer to notice the car when it was travelling at maximum angular speed while being partially obstructed by another car, and to assume the car had continued to travel at the same maximum speed when he observes it again after it shifts from fully being obstructed to being partially obstructed as it moves into the second maxima of the angular function plot.

I agree with the conclusion that the police officer must have made a mistake because the reasons have been satisfactorily been proven in this paper. If all

the considerations discussed in this paper actually occured during the incident, it would be impossible for an average human being to not make a mistake and judge the speed accurately. Visually observed angular speed is inaccurate, the defendant could have hard & braked because of a cold and if there was a car obstructing the view of the police officer, Physics would have definitely distorted the observer's reality. The fact that acceleration and deceleration could last only for a few seconds was rendered irrelevant by an additional circumstance brought upon the judge who pointed out that there were buildings at the corners of the intersection which restricted the observer's view of the defendant's car. Making the necessary adjustments in section three yielded a graph that further ratified the defendant's claim.