



**CALIFORNIA STATE SCIENCE FAIR  
2013 PROJECT SUMMARY**

<b>Name(s)</b> <b>Gajan R. Nagaraj</b>	<b>Project Number</b> <b>J1814</b>
<b>Project Title</b> <b>Why Are Motorcycles and Bicycles Less Visible in Traffic?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> To evaluate why motorcycles are less visible in multi lane traffic, and develop methods to increase their visibility.</p> <p><b>Methods/Materials</b> I measured and compared the view factors of motorcycle and other vehicles from different viewpoints in multi-lane traffic. The view factor is the angle subtended by any vehicle, from one edge to another in the eyes of a viewer. I tried to use a protractor to measure this view factor and analyze the data to see how this affects motorcyclist, but this was impractical for measuring 3D view factors. So I devised my own new method to measure 3D view factors. After this I created a method to increase the view factor of a motorcycle in traffic, using fiber/glow optics. When lined the fiber/glow optics on the motorcycle I experimented to see in what way do the fiber optics/glow optics increase visibility the most. Thus the view factor subtended by the motorcycle at the viewer increased, making them more visible and making them safer in traffic.</p> <p><b>Results</b> I calculated the change in view factor, to before and after I added the fiber optics/glow sticks. Using the percentages, I was able to prove my hypothesis that motorcycles are less visible in multilane traffic, and that my method to create a visibility footprint around them did increase visibility for motorcycles in multi lane traffic.</p> <p><b>Conclusions/Discussion</b> In the end I found out that though motorcycles are less visible in traffic because their 3-D view factor and visibility are less than that of a car, bus, or truck, I was able to create a new method to increase the visibility of motorcycles using optically lighting, shaped and placed strategically, resulting in dramatic increase of the 3-D view factor and visibility. This has the potential to thus saving thousands of motorcyclists and preventing many more accidents every year.</p>	
<b>Summary Statement</b> My project is about finding out why motorcycles are less visible in traffice, and how we can make them more visible in traffic.	
<b>Help Received</b> Dad bought all the materials for the project.	