The method in the given paper uses a 3D point cloud obtained by a stereo camera mounted on the roof of the vehicle to get a bird’s eye view of the vehicle’s surroundings. The LIDAR system sends light rays in all 360 degrees around the vehicle, into the environment. It then collects information about the environment based on the time taken for the emitted rays to return.

**Algorithm:**

We get data about the length of the path taken by each light ray that was emitted from time taken for the ray to return as the speed of light is constant. We can imagine this as a group of lines emanating from the lidar and terminating at any obstacles. This is known as a beam-model. Any other vehicles or pedestrians in our grid map are removed. The remaining grid-map is a safe path for the vehicle. Using the 2D birds eye view image that we obtain; we can classify the upcoming path as various different intersections using a support vector machine as a classifier.

The LIDAR system is kept at variable distances in front of the car, depending on the speed of the car. It is kept in front at a higher distance as the car moves faster. This is because we need to examine a larger distance in order to have more time to steer the fast-moving car.

**Here are my problems with this system:**

* Let us consider a scenario where a fast-moving autonomous car is driving. Let’s say that there’s a stationary car/obstacle some distance Infront of it. It shouldn’t have a problem going around it. However, let’s say that there’s a pedestrian behind the obstacle. Since the obstacle obstructs the view of the pedestrian, the person is likely to get hit. A good solution to this would be to use a radar sensor in order to look behind obstacles and sense their velocities.
* The LIDAR system is unable to differentiate between different terrains such as gravel, grass, water, muddy roads, snow covered roads, etc. This is a major safety issue as the car needs to be operated differently in slippery terrain. The car could also fall into deep mud or water pools.