Figure 5: Open eye output

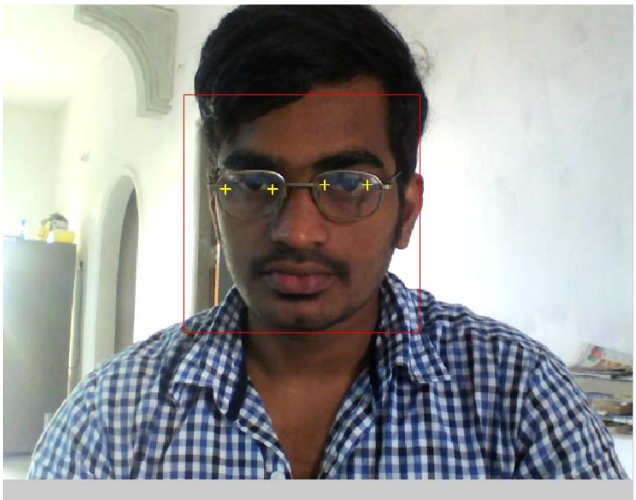

Figure 6: Open eye output wearing spectacles

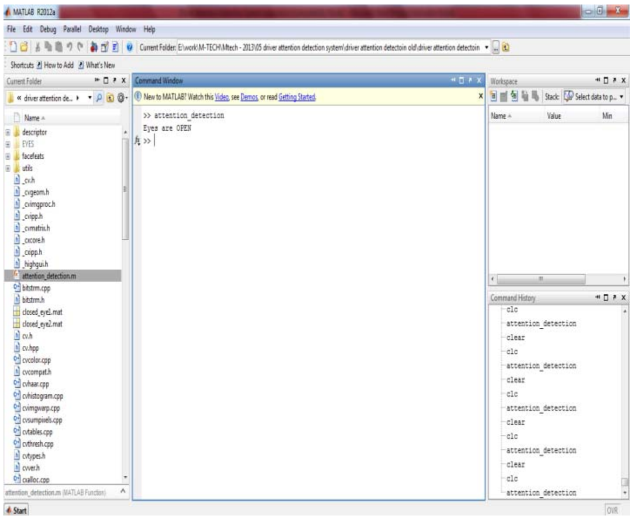

Figure 7: Control Signal output for open eye

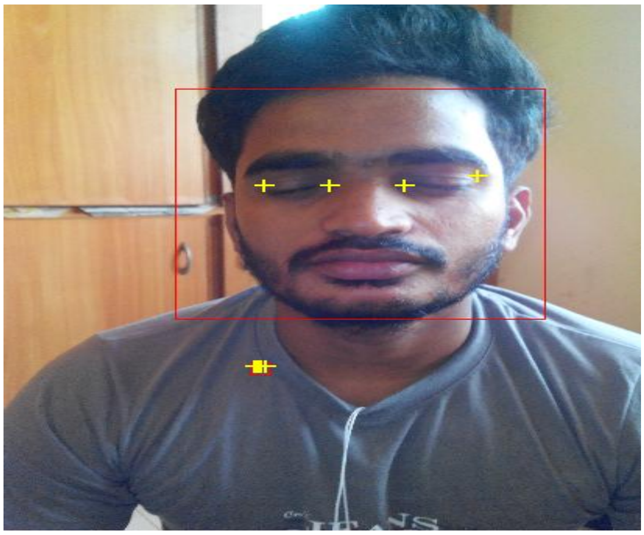

Figure 8: Closed eye output

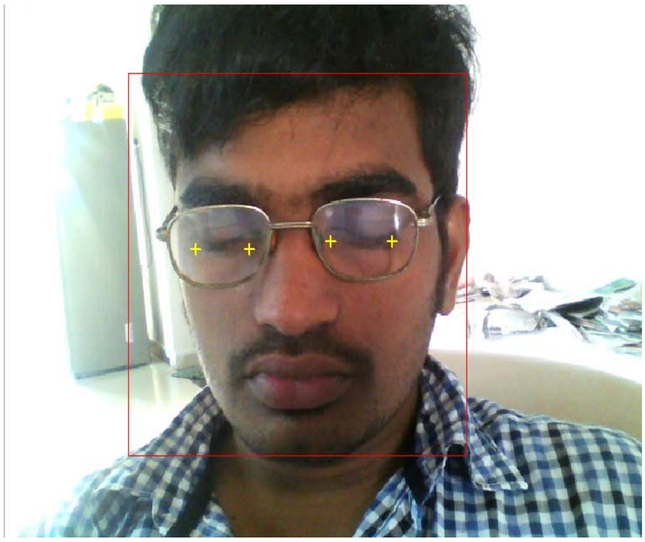

Figure 9: Closed eye output wearing spectacles

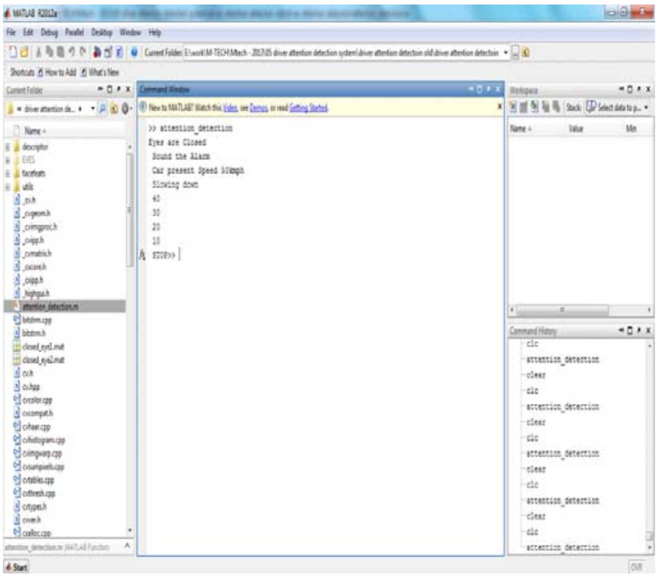

Figure 10: Control Signal output for closed eye

8. Conclusion and Future Scope

In this paper, a research project to develop a nonintrusive and autonomous driver drowsiness system based on

Computer Vision and Artificial Intelligence has been presented. This system uses advanced technologies which analyze and monitor the state of the driver's eye in real-time and for real driving conditions. It can also detect the state of driver when wearing spectacles.

To acquire the data required to develop and test the algorithms presented in this paper, several tests have been conducted and were exposed to a wide variety of difficult situations commonly encountered on roadways. This guarantees and confirms that the experiments presented here are proven to be robust and efficient for real traffic scenarios.

The system detect real time eye blink using Viola Jones object detection technique. The performance of this method was measured in different light conditions. The experiment was implemented on female and male participants; some were prescribed with eye glasses. This system easily detects the face and eye of a driver. The blinking of eye has been detected at a very high rate because independent haar classifiers are used for the left and right eyes. Most recent 100 frames of left and right eye are analysed and the average positive and negative alert were determined. The experiment was conducted for different conditions. The eyes blinks were detected more accurate for the driver without eye glasses. The positive alert without eye glasses was best recorded in after noon condition (95%) for both male and female driver. It was recorded 16% same for male and female drivers. The average performance of drowsiness detection system for male was recorded 89.35% and for the female drivers it was recorded to be 89.60%.

For future work, the objective will be to reduce the percentage error, that is, reduce the amount of false alarms; to achieve this, additional experiments will be developed, using additional drivers and incorporating new analysis modules, for example, facial expressions.

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