

# Advanced Driver Assistance System (ADAS)

ADAS, an HCL solution for safer driving



## About ADAS

The motivation behind ADAS solutions comes from the research on drowsy driving conducted by US National Highway Traffic Safety Administration. The research estimated that approximately 100,000 crashes occurring each year, were caused by driver fatigue, lack of sleep and no clear vision on rainy & foggy days. [1]

To address this problem, we developed an ADAS solution with the help of AI technologies. Our ADAS system keeps a constant watch on the driver's actions, behaviour and provides them with alerts when they are drowsy.

This driving assistant solution encompasses internal, external and environmental views for safer and enhanced driving experience.



## ADAS features

Our driver assistance system utilizes the following underlying technologies of the Deep Learning method in artificial intelligence.

- A computer vision system that can automatically detect the typical symptoms of drowsiness in a real-time video stream. It then plays an alarm if the vehicle driver appears to be drowsy.
- A more developed traffic sign detection model, that works on camera frames using SSD.
- Removing rain streaks from the individual images with the help of deep convolutional neural network (CNN) image recognition and pixel data processing technology.

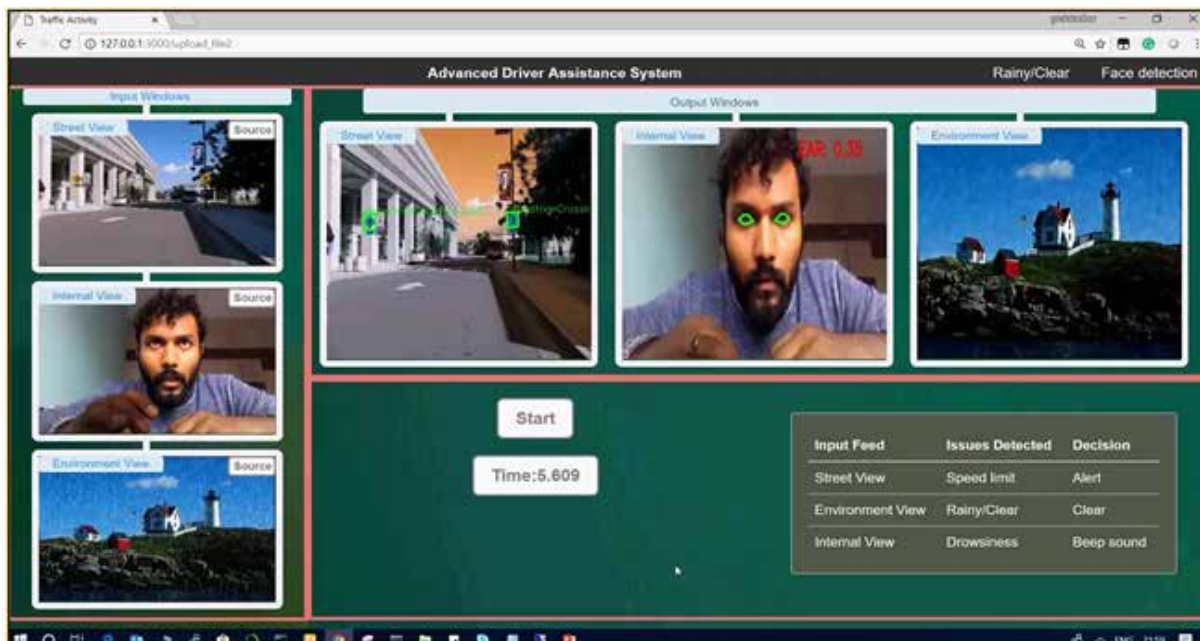


Figure 1. Different views of the input feed and corresponding issues, detected via ADAS decision making capability.

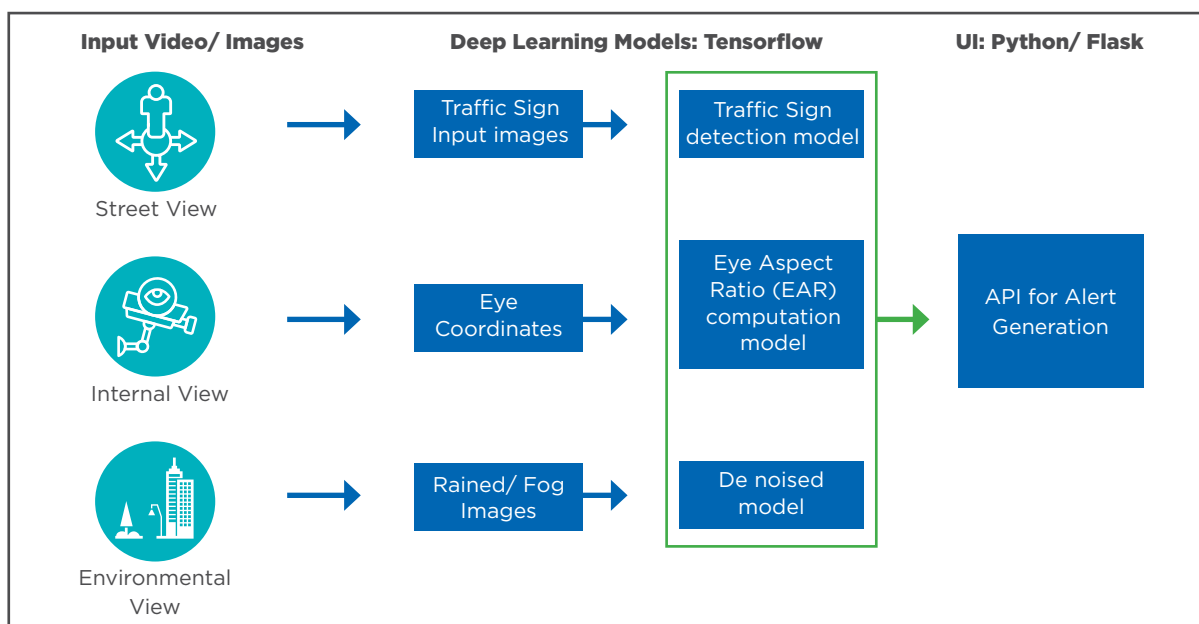


Figure 2. Deep Learning models used in ADAS



## Key Benefits

ADAS provides the following key benefits to the user.



Alerting the driver  
when drowsy



Increasing the vision  
quality for the driver  
during heavy rains and  
on foggy days



Sign boards  
detection



## Conclusion

This ADAS solution covers the De-raining of external images, enhanced drowsiness detection and sign boards detection relying on Deep Neural Network and AI techniques. New innovation taking place in edge computing platforms have made it easier to adopt ADAS solutions on mobile platforms.

The modular nature of advanced driver assistance systems enables their extension into other applications as well. Some of these cross field applications include modifying the De-raining model to remove noises from the image, enhancing the quality of the images, etc. The drowsiness detection model can also be extended to cover assessment of the behaviors of a person.



## References

<https://www.nhtsa.gov/risky-driving/drowsy-driving>;  
<https://www.nhtsa.gov/risky-driving/drowsy-driving>



[www.hcltech.com](http://www.hcltech.com)

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Please reach out to [NEXT.ai@hcl.com](mailto:NEXT.ai@hcl.com) to request a demo or to know more about ADAS.

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