

Yawn alert for weary drivers

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We've all experienced it after long hours driving, the eyelids getting heavy, a deep yawn, neck muscles relaxing, the urge to sleep, the head nodding down... But, your hands are still on the wheel and you only just stopped yourself nodding off in time to avoid the oncoming traffic.

But what if your car could keep an eye on you while you drive and nudge you when you start yawning and warn you to pull over and take a break? That's the aim of a new in-car yawn-detection system being developed by an international team in the US and India.

Writing in the inaugural issue of the *International Journal of Computational Vision and Robotics*, Aurobinda Mishra of Vanderbilt University, in Nashville, TN, and colleagues Mihir Mohanty of ITER, in Orissa and Aurobinda Routray of IIT, West Bengal, India, describe a computer program that can tell when you are yawning and could prevent road traffic accidents.

The US National Highway Traffic Safety Administration estimates that at least 100,000 road crashes are caused by driver fatigue each year.

The new program is based around an in-car camera hooked up to image-processing software that captures a sequence of images of the driver's face. It then analyses changes in the face and accurately identifies yawning as distinct from other facial movements such as smiling, talking, and singing. The yawn frequency is then correlated with fatigue behavior and could then be hooked up to a warning system to alert [drivers](#) to the need to take a break.

The algorithm is effective at yawn detection regardless of image intensity and contrast, small head movements, viewing angle, spectacle wearing, and skin color.

The researchers point out that for traffic safety, it is essential to recognize and understand the physical and [mental stress](#) leading to fatigue in drivers. Considerable research has been carried out to investigate and characterize biological signals, such as [brain waves](#) and heart activity.

However, it would be costly and inconvenient for drivers to have to connect to an ECG machine every time they took a trip. A system that watches the driver and analyses their facial expressions would be so much simpler and less invasive.

More information: "A non-rigid motion estimation algorithm for yawn detection in human drivers" in *International Journal of Computational Vision and Robotics*, 2009, 1, 89-109

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