Opel/Vauxhall working on headlamps directed by driver's eyes

March 26 2015, by Nancy Owano

Credit: GM

You might think about adding this to your future driving experience: will you control your headlamp beams with your gaze? Vauxhall/Opel is developing such a system. It aims headlights where a driver is looking. Engineers at Opel/Vauxhall are to deliver eye-tracking technology which will control the direction and intensity of light based on where the driver is looking. You will increasingly hear phrases such as "situation-appropriate lighting" or a "third generation of adaptive lighting," and you

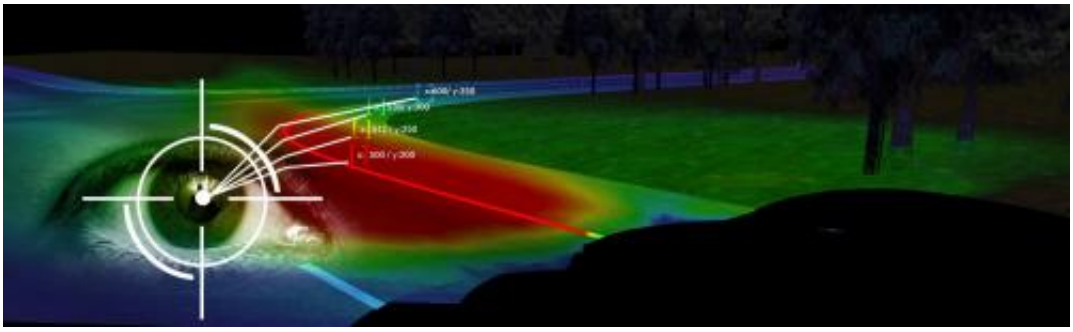
get the picture.

The announcement said the system will be introduced after the current, AFL+ bi-xenon system, featuring up to 10 lighting functions available in most Opel/Vauxhall models, and Opel/Vauxhall's LED matrix light, to go into series production soon. Vauxhall/Opel told *Gizmag* that it hopes to roll the system out in the long-term; Ingolf Schneider, Director Lighting Technology at Opel, said the team behind this has been working on the concept for around two years. It has been a collaboration between Opel/Vauxhall's International Technical Development Center and the Technical University of Darmstadt.

Paul Eisenstein in *The Detroit Bureau* said, "Take a late night walk down a dark country lane and you're likely to aim your flashlight precisely where you want to look. Imagine having a car that's equally intuitive."

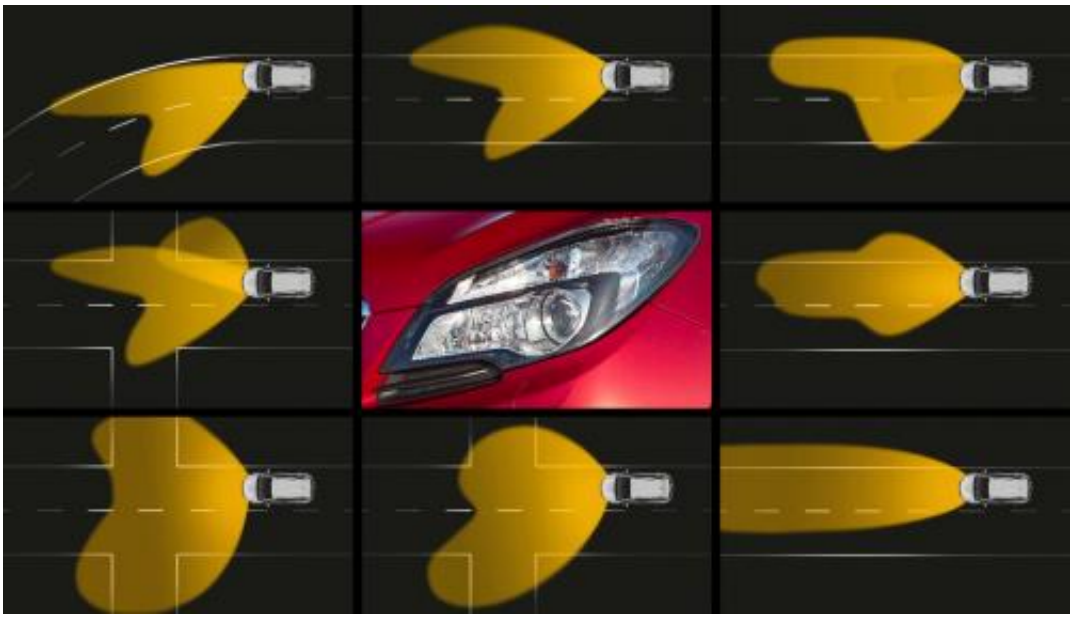
The camera is equipped with peripheral infra-red sensors and central photo-diodes. They enable it to scan the driver's eyes more than 50 times per second in dusk and night-time conditions. With fast data processing and transmission, headlamp actuators react instantaneously to make horizontal and vertical adjustments.

The company offered a glimpse into the tech's development stages. First a simple webcam was used. Focused on the driver's head, it scanned prominent points, such as nose and eyes, to detect movement and the driver's line of sight. The system translated the information into data commands for electronically-controlled actuators, which aligned the vehicle's headlamp projectors. The technique came close to achieving eye-control of the headlamps, but calculation of data took too long, said the company, and the webcam's recording rate was too slow to meet requirements of road-traffic conditions. The breakthrough, they said, was in optimizing the camera's operating parameters and adaptation of the eye-tracking algorithm.



Lightning-fast reaction: The camera in Vauxhall’s eye-tracking system scans the driver’s eyes more than 50 times per second to instantaneously adjust the headlamp beam. Credit: GM

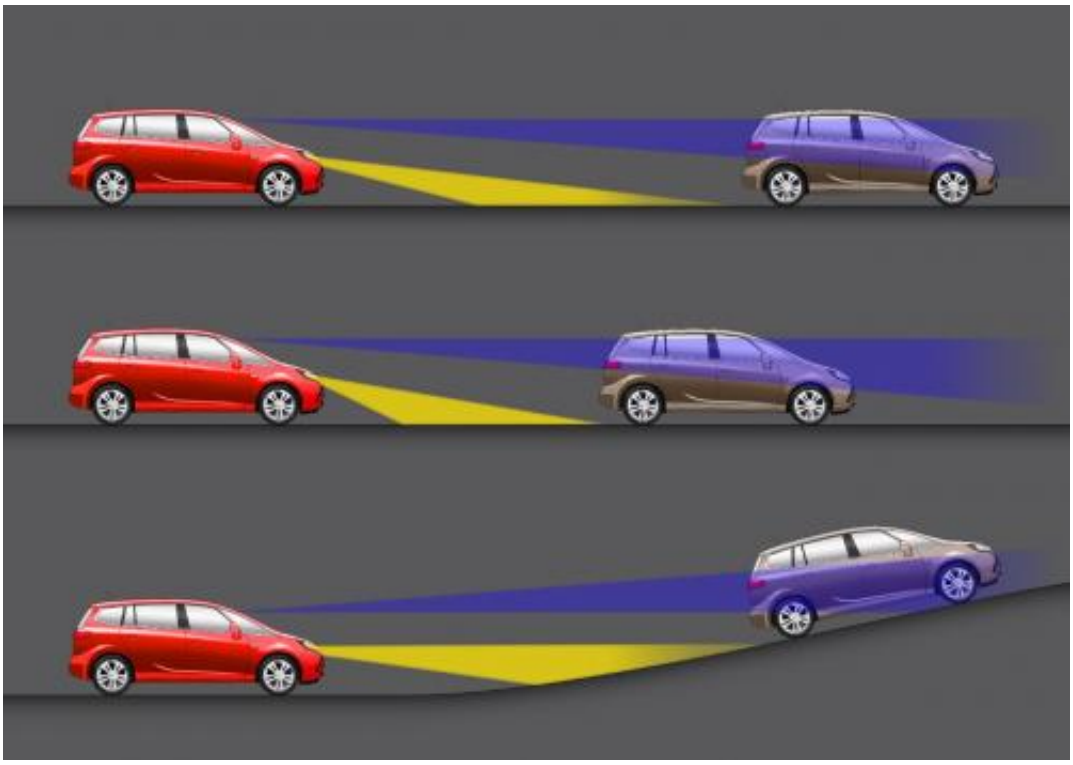
They described a hurdle—the way in which a driver's eyes unconsciously jump from one focal point to another. If headlamps were actually to follow precisely this movement, the car's light cone would jerk around erratically. They worked on this by developing a "delay algorithm" to ensure a flowing movement for the light cone. Even if the driver is momentarily distracted from looking at the road ahead, they said, lighting is always provided in the direction of travel. The low beam of the headlamps is programmed to ensure sufficient illumination.



Adapts to every situation: Vauxhall Mokka's AFL+ xenon headlamp beams automatically adapt to a diverse range of driving situations, road and weather conditions. Credit: GM

They also said that the eye-tracker needs no individual calibration; the system works with any driver, no matter what their size.

Light as day: Vauxhall's LED matrix light system makes glare-free high beams the standard. This benefits Vauxhall drivers – and the preceding vehicle. Credit: GM



Light as day: Vauxhall's LED matrix light system makes glare-free high beams the standard. This benefits Vauxhall drivers – and the preceding vehicle. Credit: GM

More information: media.gm.com/media/gb/en/vauxh … king-technology.html