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A Sharper Picture for Night Vision

By JOHN R. QUAINDEC. 5, 2014

An animal in danger is highlighted in yellow in the latest Autoliv night vision.

Illuminated like ghosts on an LCD screen, figures pop out from behind parked cars in the darkness, and apparitions walk shadowy dogs across the street. Then, suddenly, a yellow icon of a cyclist appears in the head-up display on the windshield, and a warning alarm sounds. It's all part of the latest generation of night vision technology appearing as on option on several vehicles this year.

Primarily intended to prevent collisions with pedestrians and deer, the latest systems use infrared cameras and software designed to recognize the heat signatures of humans and animals. The night vision system that I recently tested was installed in a 2015 BMW X5 as a $2,095 option, but it is also available in a variety of vehicles from Audi, Mercedes-Benz and Rolls-Royce.

Early versions of infrared night vision, like the system on the 2000 Cadillac DeVille, produced murky green images projected onto a head-up display.

The picture didn't make it obvious when a living thing was in danger of becoming road kill, and some drivers found it distracting.

The improvements in the current technology, according to Richard Seoane, general manager of Autoliv Night Vision Systems, the company that developed the BMW system, include the use of far infrared cameras, higher-resolution displays and more sophisticated software that can recognize the heat signatures of pedestrians, cyclists and animals, highlighting them in yellow and, when they are close enough to be in danger, displaying alerts. The software has been programmed, for instance, to recognize deer from a variety of angles.

The infrared camera cannot see through glass, so it has to be mounted in the car's grille, but it can deliver warnings about objects 100 to 500 feet ahead.

On city streets, a family standing in the shadows on the sidewalk was painted in ocher on the BMW's main LCD screen. The primary video image looks like a black-and-white negative, with colder objects appearing as black silhouettes while warmer, living beings appear as white apparitions. Animals and people in potential danger are painted yellow.

On a dark country road where deer are usually plentiful, I didn't witness any white tails, but the system did highlight a squirrel on the road and a bear lurking in the woods, both of them invisible to the eye.

Neither, however, invoked a warning icon in the head-up display. Such alerts occur only when the frame-by-frame tracking predicts, based on steering input and vehicle speed, that a collision is imminent.

"The danger zone is controlled by the manufacturer," Mr. Seoane said. The BMW's range is slightly bigger than the width of the car, for example, whereas Audi's version looks within the width of the lane. In addition, the BMW system will prime the brakes when a potential collision is indicated, but it does not wrest control of the car away from the driver or engage the automatic emergency braking system to stop the vehicle. That's because the system is far from infallible.

In my test drives, it became apparent that the night vision is tweaked to avoid alerts for obvious obstacles or false warnings, which can cause irritated owners to shut off the system. For example, the system did not detect a tollbooth employee strolling across the lane as I approached. It also failed to warn me of a pedestrian who jaywalked in front of me in bumper-to-bumper traffic. (It will not highlight people immediately in front of the car.)

The system didn't isolate a cyclist crossing my path in an intersection, but later illuminated the same cyclist pedaling in front of me in the lane.

Conversely, I was grateful for its warning about a pedestrian stepping from between parked cars on a wet night.

On a starless, overcast midnight drive, a glance at the center display revealed that I was heading into mountains that were otherwise invisible in the landscape ahead.

The challenge of flawlessly detecting every potential threat and identifying the difference between, say, a deer running toward or away from the car, means it will be years before night-vision systems will also automatically brake a vehicle.

The next technological steps are more likely to focus on delivering more information to assist drivers in the dark. Autoliv, for example, is promoting another system that is integrated with the headlights and can aim a spotlight at people and animals in a car's path. The spotlight is aimed low enough to avoid blinding pedestrians.

Autoliv says the spotlight system is already available in Europe on the BMW 5, 6 and 7 Series cars as well as the new X5 and X6 crossovers.