

Inspector gadget

An Israeli start-up is using artificial intelligence to automatically perform visual inspections of undercarriages in a fleet of 150 buses at an Israeli depot of bus operator Kavim, reports Will Dalrymple

The system, installed in a trench near the depot exit and operating for a year, visually scans buses on their way out in the morning, and when they come back in the evening. It automatically picks up visual anomalies such as leaks, cracks, bends in componentry, dents, loosened electrical connectors, or corrosion.

Branded UVeye (under-vehicle eye), it was originally developed in Israel for detecting bombs.

At the depot in Modiin, high-speed digital cameras take multiple images of the undercarriage as the bus drives over. A typical installation of five cameras takes a total of 900 images/second. A site computer processes those images and passes on a data bundle to a cloud-based deep learning engine that runs in the cloud, and analyses the images for anomalies, all within a few seconds.

To do that, UVeye first breaks up the undercarriage into its different elements, and analyses each. It does not compare the image it took with a stored image, explains UVeye chief strategy officer David Oren. Instead, its understanding of what is normal and what is not relies on training artificial intelligence (AI) algorithms that mimic human learning.

He explains that with a story: "When my oldest daughter was two, she used to see a cat in the street, and say 'dog'. She didn't differentiate between the two. When she turned three, she didn't make that mistake any more. I don't know what I did - probably nothing - but her brain picked it up anyway. In its first demonstration of its deep learning AI visual engine [in 2012], Google would analyse an uploaded image and tell you whether it was a dog or cat. How? It was not like it had images of all of the



dogs and cats in the world. It was not a comparison; this was based on training and learning."

However, he adds that in commercial fleet applications, where the system is analysing a fleet, its accuracy can be increased by feeding in extra reference information about the vehicles.

UVeye is now marketing three systems: Helios, described above; a tyre sidewall inspector (Artemis), which also measures tyre pressure by the angle at which the tyre touches the road; and a vehicle body inspector, Atlas.

In July, the company announced that its third funding round raised \$31 million from automotive OEMs Toyota and Volvo and vehicle insurer WR Berkley, adding to pre-existing partnerships with Daimler and Skoda.

Oren says the company has existing customers in the UK, but declined to reveal their names. [IE](#)

DRIVE-OVER TYRE READER CELEBRATES MILLIONTH SCAN

SnapScan, a digital service developed by Nokian Tyres, was first introduced as a pilot in 2016 in a parking garage in Helsinki, Finland. It has since spread to other cities in Finland as well as Oslo, Norway. All of these units combined

have already produced 1 million scans. The system uses a drive-over scanner to measure tread depth. Registered users are recognised by their number plate, and the system automatically sends those drivers a report to their mobile device.

"Modern cars are equipped with a lot of safety technology, which is great. However, no safety equipment will help keep the vehicle on the road as efficiently as tyres that are in good condition," says Ville Nikkola of Nokian Tyres.

