

We use cookies to offer you a better browsing experience, analyze site traffic, personalize content, and serve targeted advertisements. By using our website, you agree to the use of cookies as described in our [Cookie Statement](#).

✓ Accept Cookies X

≡ MIT Technology Review

Subscribe

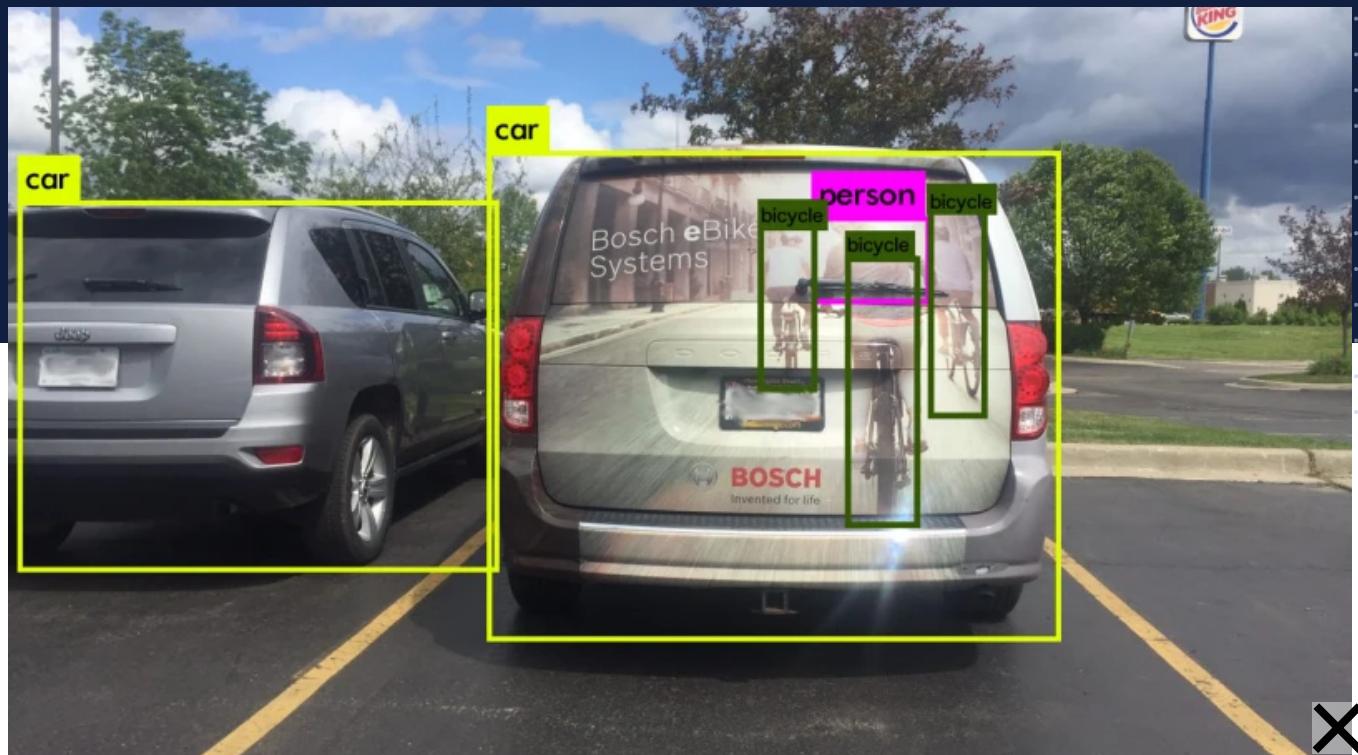
## SMART CITIES

# This Image Is Why Self-Driving Cars Come Loaded with Many Types of Sensors

When's a pedestrian not a pedestrian? When it's a decal.

By Jamie Condliffe

July 21, 2017



Autonomous cars often proudly claim to be fitted with radar, lidar, you name it. But if you've ever wondered no further than this picture.

Decarbonizing industries with connectivity & 5G

Learn more X

You're looking at what's known in the autonomous

≡ MIT Technology Review

Subscribe

Learn more about emerging tech with our award-winning journalism and

We use cookies to offer you a better browsing experience, analyze site traffic, personalize content, and serve targeted advertisements. By using our website, you agree to the use of cookies as described in our [Cookie Statement](#).

✓ Accept Cookies X

Most autonomous cars overcome issues like the baffling image by using different types of sensing. “Lidar cannot sense glass, radar senses mainly metal, and the camera can be fooled by images,” explains Danny Atsmon, the CEO of Cognata. “Each of the sensors used in autonomous driving comes to solve another part of the sensing challenge.” By gradually figuring out which data can be used to correctly deal with particular edge cases—either in simulation or in real life—the cars can learn to deal with more complex situations.

Tesla was criticized for its decision to use only radar, camera, and ultrasound sensors to provide data for its Autopilot system after one of its vehicles failed to discern a truck trailer from a bright sky and ran into it, killing the driver of the Tesla. Critics argue that lidar is an essential element in the sensor mix—it works well in low light and glare, unlike a camera, and provides more detailed data than radar or ultrasound. But as Atsmon points out, even lidar isn’t without its flaws: it can’t tell the difference between a red and green traffic signal, for example.

The safest bet, then, is for automakers to use an array of sensors, in order to build redundancy into their systems. Cyclists, at least, will thank them for it.

(Read more: “[Robot Cars Can Learn to Drive without Leaving the Garage](#),” “[Self-Driving Cars’ Spinning-Laser Problem](#),” “[Tesla Crash Will Shape the Future of Automated Cars](#)”) 

by Jamie Condliffe



#### KEEP READING

#### MOST POPULAR



Decarbonizing industries with connectivity & 5G

[Learn more](#)

ERICSSON

≡ MIT Technology Review

[Subscribe](#)

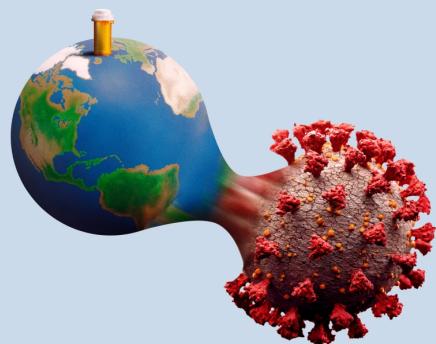
Learn more about emerging tech with our award-winning journalism and

We use cookies to offer you a better browsing experience, analyze site traffic, personalize content, and serve targeted advertisements. By using our website, you agree to the use of cookies as described in our [Cookie Statement](#).

✓ Accept Cookies



By Jane Lytvynenko



## How Pfizer made an effective anti-covid pill

A covid pill could cut serious illnesses and help prevent the next pandemic. But it's expensive and in short supply.

By Antonio Regalado



## The metaverse has a groping problem already

Decarbonizing industries with connectivity & 5G

[Learn more](#)

IN ASSOCIATION WITH ERICSSON

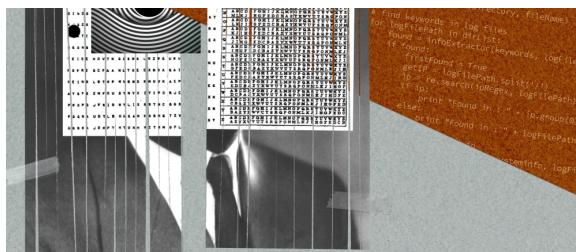
≡ MIT Technology Review

[Subscribe](#)

Learn more about emerging tech with our award-winning journalism and

We use cookies to offer you a better browsing experience, analyze site traffic, personalize content, and serve targeted advertisements. By using our website, you agree to the use of cookies as described in our [Cookie Statement](#).

✓ Accept Cookies



## Meet the NSA spies shaping the future

In his first interview as leader of the NSA's Research Directorate, Gil Herrera lays out challenges in quantum computing, cybersecurity, and the technology American intelligence needs to master to secure and spy into the future.

By Patrick Howell O'Neill

STAY CONNECTED



Get the latest up  
MIT Technology

Discover special offers

Decarbonizing  
industries with  
connectivity & 5G

Learn more

ERICSSON

MIT Technology Review

Subscribe

Learn more about emerging tech with our award-winning journalism and

We use cookies to offer you a better browsing experience, analyze site traffic, personalize content, and serve targeted advertisements. By using our website, you agree to the use of cookies as described in our [Cookie Statement](#).

✓ Accept Cookies



# A new era for data: What's possible with as-a-service

[Download the report](#)

IN ASSOCIATION WITH Dell Technologies



Our mission is to bring about better-informed and more conscious decisions about technology through authoritative, influential, and trustworthy journalism.

**Subscribe** to support our journalism.

[About us](#)

[Help & FAQ](#)

[Careers](#)

[My subscription](#)

[Custom content](#)

[Editorial guidelines](#)

[Advertise with us](#)

[Privacy policy](#)

[International Editions](#)

[Cookie statement](#)

[Republishing](#)

[Terms of Service](#)

[MIT News](#)

[Contact us](#)



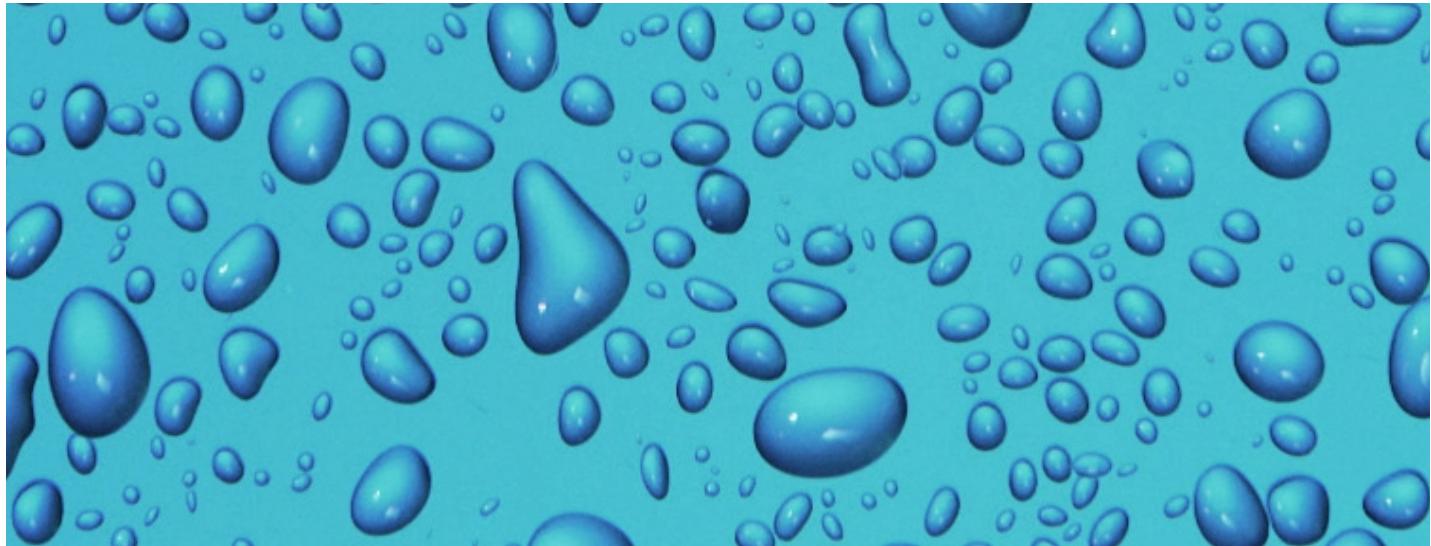
MIT Technology Review

[Subscribe](#)

Learn more about emerging tech with our award-winning journalism and

We use cookies to offer you a better browsing experience, analyze site traffic, personalize content, and serve targeted advertisements. By using our website, you agree to the use of cookies as described in our [Cookie Statement](#).

✓ Accept Cookies



## Decarbonizing industries with connectivity & 5G

[Learn more](#)

IN ASSOCIATION WITH

ERICSSON

### 2 STORIES REMAINING

Learn more about emerging tech with our award-winning journalism and