

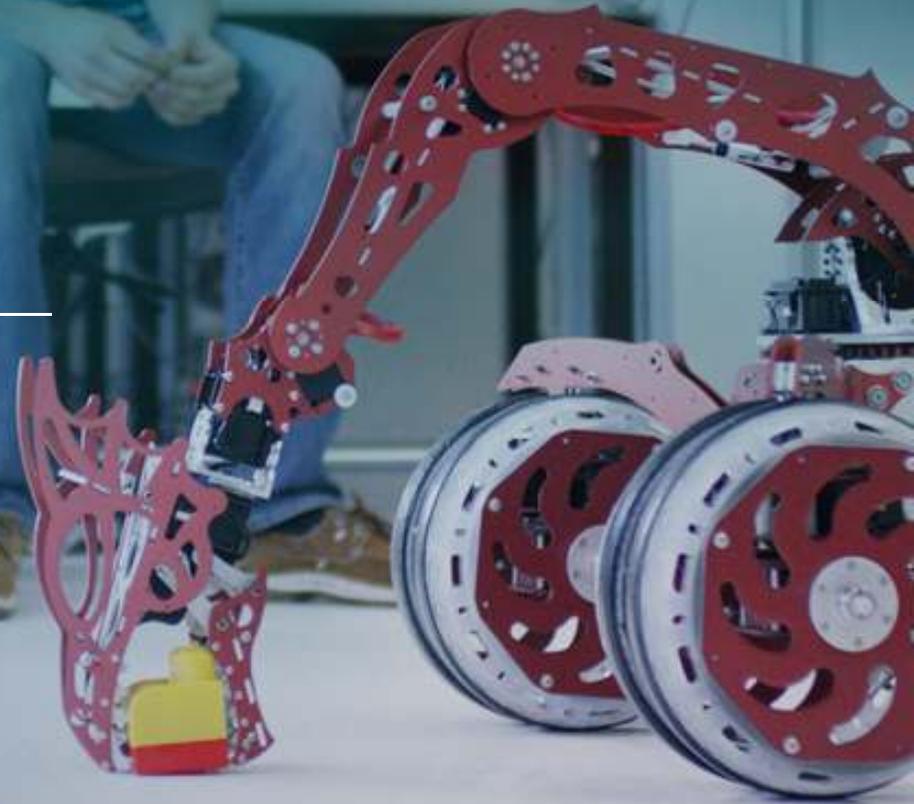
Matt Grob

EVP & Chief Technology Officer,
Qualcomm Technologies, Inc.

Smartphone-powered future

QUALCOMM®

@GrobMatt

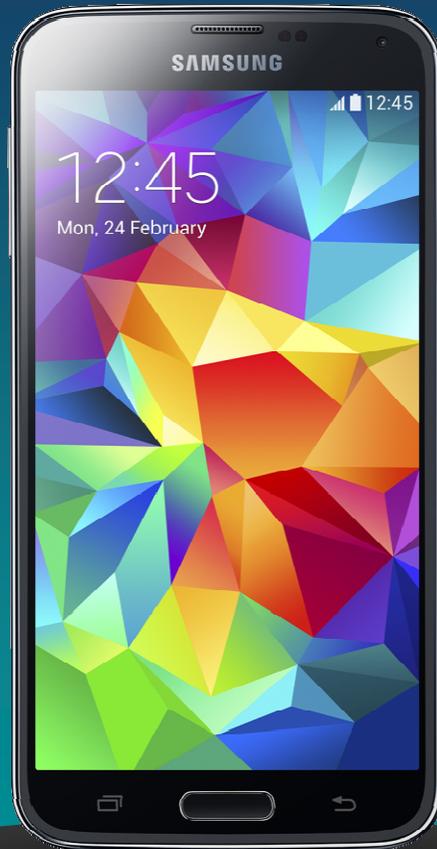


Energy

Enough to lift an adult
several stories high

Power

More computing power than early
'90s supercomputer



Utility

Replaces
6+ devices

Signal

Decodes signal attenuated
100,000B times

We are inventing new, transformative technologies



**Solving the 1000x
data challenge**



**Providing the connectivity
fabric for everything**



**Bringing cognitive
technologies to life**





Transforming health

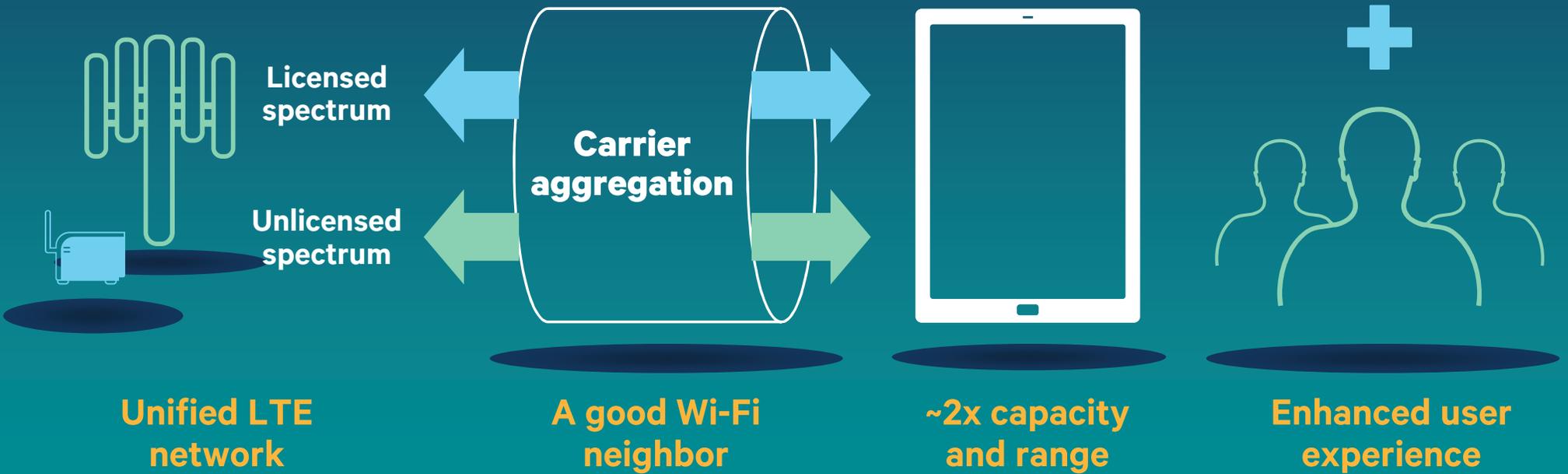
More affordable and accessible

45% reduction

in mortality rate for chronic disease patients using telehealth

Advancements

Extending LTE into unlicensed spectrum



Application

Transmission of rich medical data

More bandwidth and less delay
for near real-time, remote
medical imaging



Advancements

Qualcomm® OptiZoom™ camera feature

Disabled

Digital zoom (interpolated)



Enabled

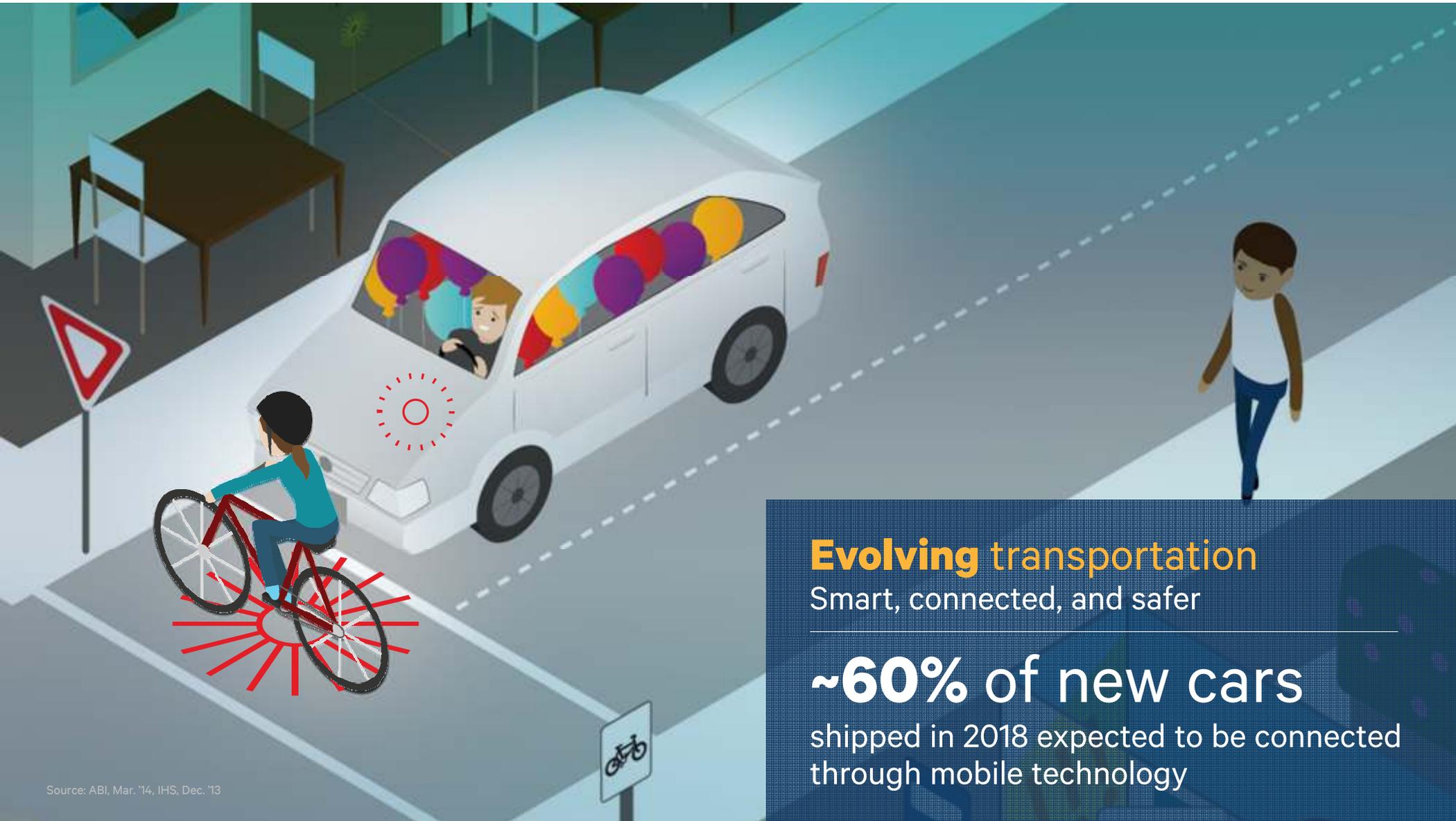


Application

Low-cost remote diagnostics

Bringing dermatology
to low-income areas virtually





Evolving transportation

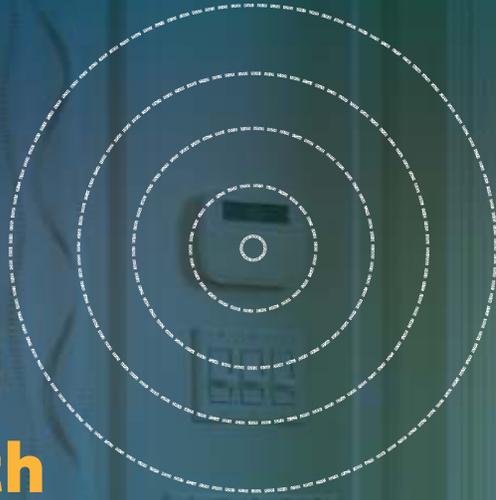
Smart, connected, and safer

~60% of new cars

shipped in 2018 expected to be connected through mobile technology

Advancements

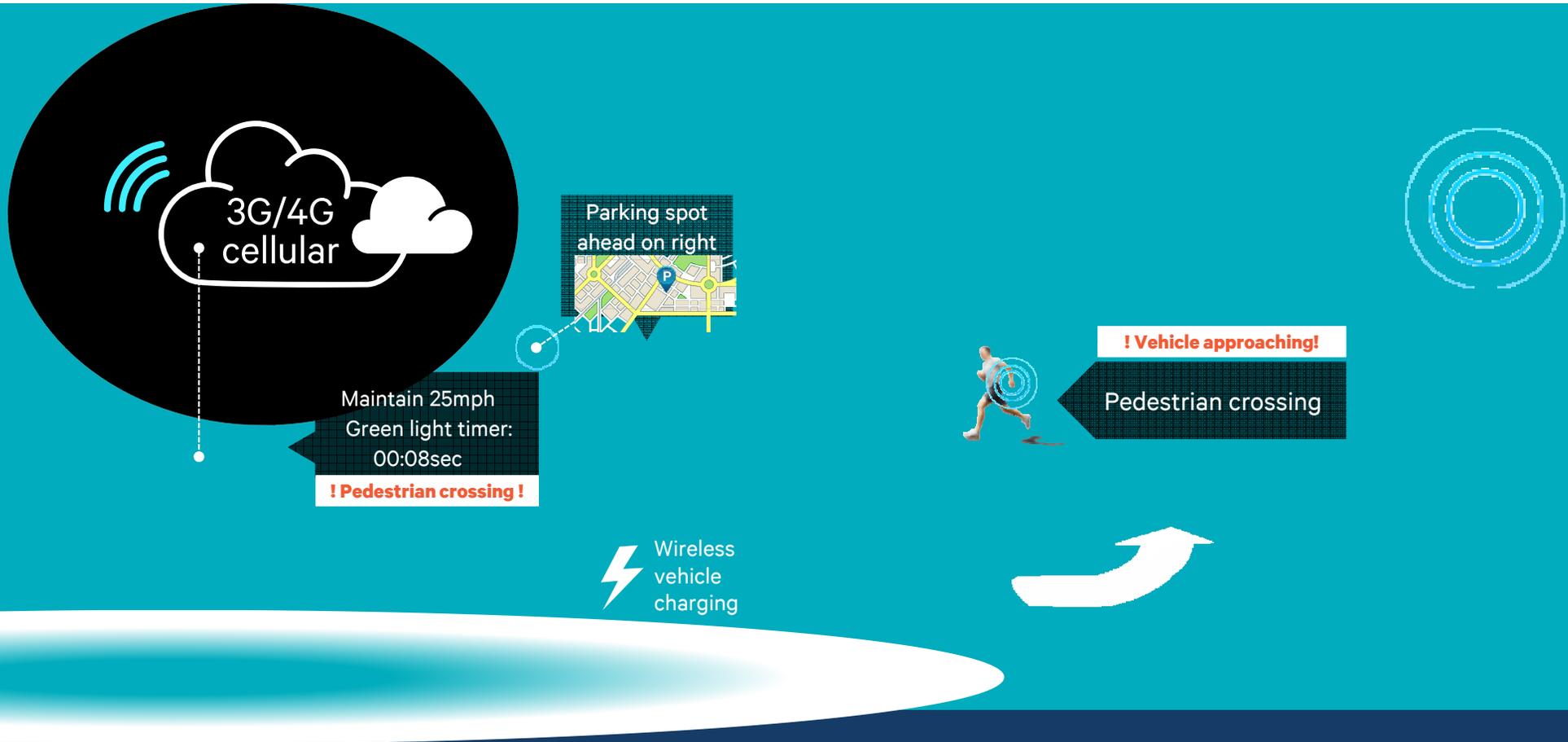
Device-to-device connectivity



- **Bluetooth**
- **802.11p (DSRC)**
- **Wi-Fi Direct**
- **LTE Direct**

AllJoyn is a collaborative open source project of the AllSeen Alliance.





Application

The car seamlessly communicates with its environment

LTE Direct

Device-to-device discovery with unparalleled scalability and capacity

	BT-LE	LTE Direct
Discovery density (# of devices covered)	Hundreds	Thousands
Range (m)	~50	~500
Active Duration (ms)	~4000	~75

- Battery efficient
- Autonomous discovery
- Long range
- Distributed ad-hoc synchronous system
- Highly scalable
- Private sensitive



Source Qualcomm Technologies simulations; Assumptions: outdoor deployment model (e.g. Farmer's market), Ped A channel model, ITU-1411 pathloss mode, Carrier frequency of 2 GHz for LTE Direct / 2.4 GHz for BT-LE, System bandwidth of 10 MHz FDD for LTE Direct / 2 MHz for BT-LE, LTE Direct protocol implementation of 75 subframes every 18 seconds, BT-LE beacon protocol implementation of advertising for 1,518 ms every 1.20 s with <20% collision / scanning for 256 ms every 1.28 s

“The personal drone is basically the peace dividend of the smartphone wars...I’ve never seen technology move faster than it’s moving right now, and that’s because of the supercomputer in your pocket.”

Chris Anderson, CEO of 3D Robotics

Source: “Epiphanies from Chris Anderson”, Foreign Policy Magazine, May/June 2013



Advancements

Cognitive technologies support more intuitive devices

Reasoning

Learn, infer context
and anticipate



Perception

Hear, see, monitor, and
observe

Action

Act intuitively and
interact naturally

Cognitive technologies



Cognitive connectivity



Intuitive security



Computer vision



Machine learning



Always-on sensing



Immersive multimedia

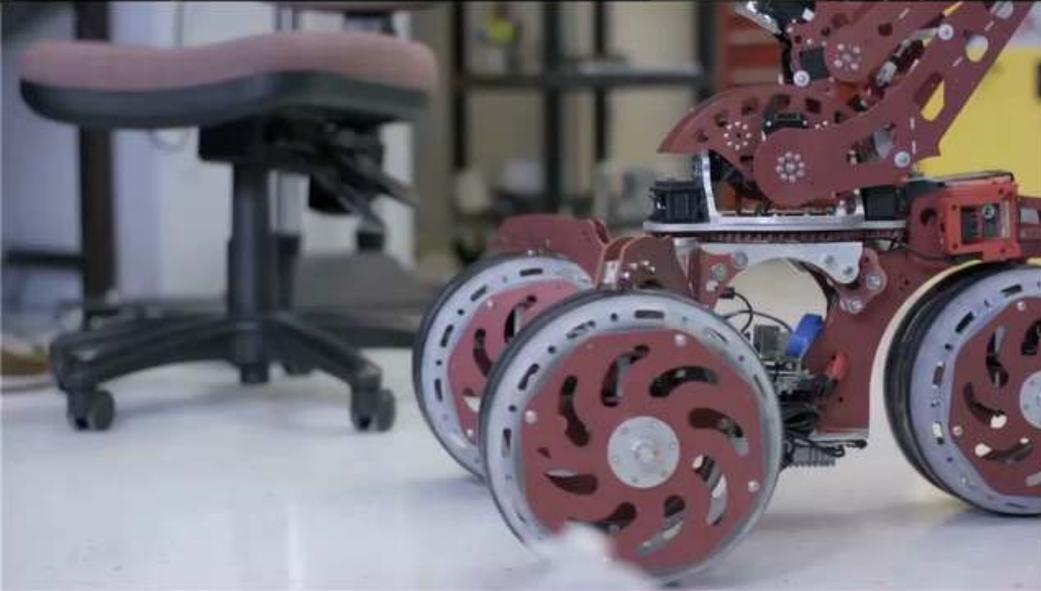
Computer vision



Machine learning

Protecting you from malware and enabling object classification in robots





Thank you

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