CES® 2019
Trends & Insights

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Consumer Electronics Show
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Contents

CES-tivus for the rest of us. .................................................. 3
Everything you could possibly want........................................ 4
Three big trends at CES 2019 ................................................. 5
Integrating autonomy into a manual world.............................. 9
What’s “Indecent”?................................................................. 12
War of the voice-enabled assistants ..................................... 14
Cool stuff catch-all ............................................................... 23
CES-tivus
for the rest of us

We recently sent Ryan Braunstein, San Francisco Engineering Studio Lead, and Industrial Designer Erik Eagleman to Las Vegas to soak in all the energy, innovation, imagination and, well, hype that is CES®.

**CES consists of three mega-venues bursting with big ideas:**

- **Tech East**: Audio, automotive, electronics, gaming, video, wireless and services, digital imaging, photography, drones, and various realities
- **Tech West**: Emerging technology, fitness, healthcare, trackers, and lots of home-focused IoT products
- **Tech South**: Conference sessions, networking events, exhibits, and meeting rooms

Just to give you an idea of the scale, more than 180,000 people from over 155 countries attended this year, including 6,500 from the media. There were more than 4,500 companies exhibiting. It’s the largest event in Las Vegas every year.

Walking the show floors is mentally and physically exhausting. The stimuli flying at you is loud, eye-popping and non-stop. It can leave you feeling a bit cynical one moment and totally inspired a few seconds later.

If that appeals to you, we hope you get a chance to attend CES someday. If not, Ryan and Erik have ventured into the whirlwind for you. We hope you enjoy their articles on the hits, misses, politics and trends seen at CES 2019.
Everything you could possibly want...

By Erik Eagleman

This was my first CES experience. After many years of wanting to go to see what all the fuss is about, I finally got my chance. As expected, it was overwhelming with enough content to keep anyone with ADD (like me) continually entertained. There is so much to see, I truly believe there is absolutely no way that one person can see everything there, even if they are given an entire week to walk the grounds.

Each company has spent a lot of time and money to get to the show and deserves attention, but there just isn’t enough time in the day. Due to this, you have to be very critical with how you spend your time. I had to keep telling myself, “Get the idea and move along. Keep walking!” This worked for the most part, but there are real time-sucks that keep you there. And the ones that keep you there are, for me, the ones that probably deserve the attention.

It kind of reminded me of going to Art Basel, which is the world’s largest contemporary art show. In the show, you walk down long hallways lined with artwork from the world’s best current artists, who only have room to show one or two pieces of art. For contemporary art, a lot of the focus is to grab your attention in some way, typically emotionally. So when walking these halls, you can’t help but get overwhelmed with emotion. In fact, I had to take a break after just one hall because of the impact the art had. My mind was exhausted. This was the same feeling I had when walking CES. Great stuff, but it deserves all of your senses to be awake and ready.

As I was walking on the third day at the show, I started to develop this thought about the show and what it had to offer. I didn’t think there was anything there that I actually needed. When I say “need,” I mean can’t live without. However, it did have everything I “want.” CES is the show of want, but nothing we need.

I reminded myself that the term Consumer Electronics almost implies that we don’t need it. We have obviously been able to get by just fine for the past two million years or so without this stuff. So instead of focusing on the world of want instead of need, it’s maybe best to be optimistic about everything that is there and discuss the “cool,” because there is a lot of cool! Cool to the point that you can sometimes justify a want as a need.

CES is the show of want, but nothing we need.
Three big trends at CES 2019

by Ryan Braunstein

I’ve had the pleasure of going to CES several times over the years. It is an exercise in sensory overload with a lot of unnecessary stuff, but it’s also a great place to see the trends of the future in action. Here are a few overarching thoughts on what I saw:

1. **The voice-enabled digital assistant war is in full swing.** Alexa, Hey Google, Bixby (Samsung), and the absent-from-CES but certainly relevant Siri are all vying for market share and devices abound with integration. Everything from an Alexa-enabled toilet by Kohler to a Google-enabled makeup mirror by SimpleHuman ... and so many more devices in between seem to have a microphone, speaker, and connectivity to our cloud overlords.

2. **Autonomous cars:** It’s not just car companies that are thinking about what driverless vehicles will look like, how users will interact with them, and what the experience will “feel” like, plenty of eclectic and non-traditional new-to-mobility companies have taken deep dives into autonomy. Panasonic, Yamaha, and countless unfamiliar Chinese brands are showing their versions of driverless cabins or vehicles of some sort (a golf cart in Yamaha’s case). I found one from a French consortium, another from eGo Mover, and countless others ranging from existing automotive component manufacturers to obscure suppliers looking to make a splash on the dash (scent and moisture included).
Three big trends of CES 2019

Some of the stranger “experiences” were shown by the Korean car companies. They went well beyond the form of the vehicle and I would dare say focused on far-out passenger experiences. I rowed using a handle that appeared out of the dash (presumably connected to a rowing machine out of sight) with my fellow passengers trying to synchronize our strokes for the fastest time in a race against ... no one. And every major car maker has their demo showcasing neighborhood mapping and safety for autonomous driving, as if they have it all solved.

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Back to interiors and driverless experiences, at Faurecia we were introduced to sound coming from the interior body panels (no speakers, even vibration in the seat from SUBPAC), a digital assistant that worked in conjunction with Alexa, gesture controls, personalized sound from each headrest, and moving seats and dashboards to create everything from in-car spa treatments to a shared cinematic experience.

Some of the more focused hardware companies like Panasonic were showcasing practical equipment such as Lidar built into headlights.

Also, the intersection between drone, robot and autonomous vehicle is starting to blur. Honda showcased autonomous bots and task cart vehicles, along with a single-ball-wheel balancing bot that seemingly floated around its stage while moving away from people gesturing beyond the glass barricade. Bosch showed an autonomous lawnmower (there were many other robotics companies that did, too), and I saw everything from autonomous luggage-carrying bots to pick-n-pack warehouse bots to countless autonomous personal assistant robots. All are using complex software to figure out where they can drive safely and evaluate gestural commands, just like in the car.

3. Spatial tracking and facial recognition systems. Wow, these are now being advertised as able to read your emotions and heart rate. I was able to verify one system recognized the SKU of the product being “shopped,” while another system was watching behavior to see if a pair of people were a couple or individuals (once the random passerby next to me put his hand on a woman’s shoulder, they were linked as a pair). Get in a fight and the system will alert authorities automatically. Same goes if you faint. They guess your age (poorly), seem to do a better job at gender, and I have no idea whether they’re accurate about mood (but they tried).
One of my favorites from the show is a little robot owl that reads books to your kids. Seemingly it worked regardless of language or orientation of the book, and it only read the page that was actually open.
Mobility has taken on new, and sometimes unusual, forms. Skate-Shoes (or perhaps Hover Shoes, too early to tell what the trendy name will be) are so fresh the prototypes were showcased but not ready to test-ride. Underwater or above it, you can now cruise around at speeds previously unimaginable. And bionic suits are just on the horizon, changing the way warehouse workers will protect their bodies and possibly improving posture for the rest of us.
Integrating autonomy into a manual world

by Erik Eagleman

At this year’s CES, you couldn’t walk through the show without noticing the attention toward autonomous vehicles. Autonomy is coming and it’s coming strong. There are cars like Tesla with SAE Level 2 autonomy and Audi claims that the new 2019 A8 will be the first production car with SAE Level 3. But the goal for most automakers – and what was mostly shown in concept form at CES – SAE Level 5, which means the car is capable of completely driving itself without any help from a driver in all conditions. This is by far the scariest and furthest reaching level. Some vehicles might not even have a steering wheel.

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A lot of brands were trying to come up with completely different ways of thinking about how a fully autonomous driving experience would be in the future. How we could use it for more than just transportation. If we don’t have to think about driving anymore, what other things could we do with this time?
Integrating autonomy in a manual world

Could we be more productive or relax and recharge for the day? Could the time be spent playing games or to raise our heart rate to prepare for time at the gym? These are just some of the questions it seems that the automotive brands are asking.

How do autonomous cars integrate into a fully manual-driven world? Audi had a great booth with a “Tech Talk” discussion on this very topic. One misconception with autonomous cars is the ability to help with traffic congestion. Audi has been doing some research with the Karlsruhe Institute of Technology on autonomous vehicles and their impact on traffic. It turns out that even if 60 percent of all vehicles had autonomous capabilities within a dense traffic situation, it would only result in a four percent increase of flow. That’s hardly an improvement. In fact, they stated it would take more than 85 percent of vehicles to go fully autonomous before you would start to see real benefits. Due to these findings, Audi and many other companies are finding more benefit in providing a new user experience inside the vehicle — so at least you’re entertained/relaxed/working while sitting in traffic.

Since autonomy can’t improve traffic congestion in the near term, one thought is to improve the inside experience so that carpooling would increase. If vehicles’ average occupancy increased from 1 to 1.3, there would be considerable traffic flow improvement. Carpooling addresses traffic flow by reducing the number of cars on the road. To encourage carpooling, some automakers are trying to create an environment that gives multiple people riding together something to do and ways to interact, just in case typical conversation is not enough.

If interaction isn’t your thing, Faurecia is working on sound bubbles that integrate into the headrest. When you lean forward, you might hear the highway or other passengers, but when you lean back on the headrest you’re surrounded by the music of your choice (that no one else in the vehicle can hear). Very cool to experience.
Integrating autonomy in a manual world

There is also a lot of focus on the emotional experience of the driver once the car has taken over. Emotion was a big word throughout the autonomous tech area. Panasonic was showcasing its new tech, which could detect expression, thermal temperature, odor, and seat pressure, and from that determine if you were stressed or at ease, irritated or pleased, cold or comfortable. Kia was also showing concepts (R.E.A.D. for Real-time, Emotion, Adaptive, Driving) to illustrate this, even using scent along with ambient lighting and breathing techniques given to you by an AI co-pilot to change your emotion. Verbal feedback with sayings like, “breathe in … hold … let out” and “Did you enjoy your nap?” were pretty crazy to hear from a vehicle interior.

Whill is incorporating autonomy into their wheelchair to help give people more mobility assistance. With the integration of autonomy, the chair can come to you in your home or pick you up at the curb from a taxi. Another benefit is the application at airports, where the chair will be pre-ordered and waiting for you at curb check and help bring you to your gate.

With more of these styles of vehicles being presented, it’s clear that companies are excited for this level of autonomy and that people are excited to try it out. I do think it will be a different story when we start seeing these vehicles – with four inward-facing seats and no steering wheel – driving next to us on the highway. I would rather have everyone in those vehicles rather than a small percentage driving around mixed in with crazy drivers. The regulations to get us to that level of autonomy are still some time away, in my opinion.

As far as sitting back and taking a nap on my way to see family across the country, sign me up.

It seemed like there was almost a recipe for future autonomy inside a Level 5 autonomous vehicle. A huge interactive screen, expression (emotion) detecting tech, closed-off immersive surrounding, and inward-facing seating were common at the show.

There were also a lot of products focusing on providing autonomous drive experiences that are not passenger/vehicle related. Honda was showcasing their driverless Quad that is built to handle any kind of off-road assistance for tasks including EMT evacuation, helping forest firefighters carry heavy gear, and cleaning solar panels.

Whill Quad (above); Whill wheelchair (below)
What’s “Indecent”?  

by Ryan Braunstein  

Let’s suppose, hypothetically speaking of course, that a product exhibited at CES could be used to cause severe bodily harm with a weapon to another human. Furthermore, without much effort, any person could witness the death of another person in a most gruesome manner, including skull crushing or shooting or being eaten alive, complete with blood splatter and disembowelment.

Now let’s contrast that with another product that could, hypothetically still, be used to give a woman an orgasm. Which of those two products is more indecent?

Is this a reflection of our values in the United States?

The former was exhibited on the show floor by multiple companies, including VR demonstrations, videos placed on TVs for passersby to see, and by many gaming accessory companies advertising their capabilities in realistically simulating death and destruction.

The latter has frequently been shunned by CES, usually by banning the products from being exhibited. In a well-publicized incident this year, a
What’s “Indecent”?

CES Innovation Award (granted by an independent panel of judges) was rescinded by the shows’ organizers, the Consumer Technology Association (CTA), once they deemed an innovative but sexual in nature product “immoral, obscene, indecent, profane or not in keeping with CTA’s image.”

The product I’m referring to is Ose *(shown left)* by the company Lora DiCarlo. To be clear, it is not a sex doll, nor does it look like a penis. Lora Haddock, CEO of Lora DiCarlo, is insinuating on her website in an open letter that the CTA has a gender bias against women and their sexual health.

**A double standard**

This is somewhat substantiated as last year a demonstration of VR porn (catered specifically to men) was allowed to exhibit in a ballroom (albeit off the beaten path) and there are numerous other cases of sexual-related products more catered toward men that seemed to have snuck through the exhibition qualification process.

To be honest, I did see more than one booth this year at CES demonstrating traditional sex products (vibrators, specifically) but I got the distinct impression those products weren’t the primary focus of those booths (with one exception). I also saw several products aimed at “women’s health,” such as nursing pump bras, prenatal health tracking, etc., but that category isn’t for the sexual benefit of women.

At CES, many are geared toward violent games, and yet the sexual health industry continues to struggle with even gaining booth space. Is this a reflection of our values in the United States?

Haddock states her belief that “society needs to drop the taboo around sex and sexuality – it’s a part of life and health that absolutely should be part of mainstream discourse. No shaming, no embarrassment, just the comfort and freedom to be yourself and enjoy your own body.”

I further note that “booth babes” are still present, especially in the automotive section of the show. While CTA claims to be forcing out this blatantly sexist practice, they don’t seem to be all that serious about it. At the same time, they’re engaging in a clearly sexist double standard, deeming a device for women’s sexual pleasure as “obscene.” I feel that CES is on the wrong side of innovation – progressive toward technology to the point of allowing violence to be on full display, but puritanical toward female sexual health.

Perhaps actor William H Macy said it best: “I think it’s time for somebody to say, ‘Sex is good. It’s really good; it’s great. And violence is bad — it’s always bad.’”

And maybe someone ought to tell the CTA it’s time to turn their attention to limiting the violence on display at CES, and perhaps even give back the award they took away for an innovative product that just happens to work best on a woman.
War of the voice-enabled assistants

by Ryan Braunstein

Google vs. Amazon vs. Apple
vs. Samsung vs...

The war of the voice-enabled, smart personal digital assistants is in full swing. There’s Alexa from Amazon, Hey Google from … well duh, Samsung’s Bixby, and absent-from-CES but certainly relevant Siri from Apple. They were all vying for attention on billboards and trade show booth walls, and devices with integration were everywhere this year.

Toothbrushes, toilets, makeup mirrors, hair brushes … and so many more devices in between … have a microphone, speaker, Wi-Fi and voice-recognition software embedded. It seems we’ve reached the point where even in the privacy of your own bathroom you may be unwittingly uploading to the cloud for analysis while you, ahem, download.

Certainly, we’re all aware that many cars are capable of listening to our commands, as automakers seem hellbent on putting flat, buttonless (and therefore nearly useless while driving) touchscreens into our vehicles’ dashboards, seemingly justified by claiming “well, you can always just speak to the car to turn up the heat on your feet.”

We are now well beyond the days of OnStar’s promise to unlock your car door via satellite should you ever leave the keys in the trunk. Now Apple’s Siri
War of the voice-enabled assistants

(via Carplay) can remind you to do your grocery shopping when you leave work. I suppose it won’t be long before Siri will be able to subtly steer the car to the supermarket in between your doctor appointment and picking up the kids. Perhaps your groceries will already have been shopped, paid for, and waiting for you curbside, too.

Google seemed to be implying as much with the “rollercoaster” ride they built in a parking lot at the Las Vegas Convention Center, taking a page directly from Disney’s “It’s a Small World.” The Google Assistant Ride takes you through a day in the life of a father managing chaos in his home, whose enhanced digital experience includes a morning briefing, which alerts dad to an eminent thunderstorm, real-time traffic navigation, and translation with a French baker to obtain a cake for Grandma’s birthday. The ride concludes with voice-enacted “party-mode” lighting back at home just before Grandma walks in the door, and don’t forget all the photos (which are, of course, stored in the cloud for ubiquitous access). Google’s showcase of enabled products and cars seemed to drive home the point that you can now have Google all around you all the time.

And Samsung was not alone in taking a swing at its competition; Apple (for the first time EVER) acknowledged CES’ existence with a building-sized dig at competitors’ very public privacy battles. While Apple had no official presence at the show, many booths in the Smart Home section are now advertising Apple HomeKit compatibility, thus tying them to Siri. Belkin, Sony, LG, GE, Vizio, Arlo, Ikea, TP-Link, Eve, ConnectSense, Kwikset, Nanoleaf, and Netatmo all made announcements at CES about various Apple HomeKit-connected devices, but the one that stuck out to me was Samsung’s willingness to integrate iTunes and AirPlay into its televisions (LG, Vizio and Sony are doing the same with AirPlay 2). Perhaps best put by The Verge: “A tainted software brand that most people still associate with music instead of video (iTunes) coming to a fierce competitor’s (Samsung) TV, which runs an operating system (Tizen) that it would previously have been impossible to imagine Apple touching with a 50-foot pole.”

My guess is that Apple’s willingness to drop a chipset-based integration in favor of software was intended to ensure Apple’s relevance in the connected home moving forward, as Amazon’s Alexa and Google’s Assistant appear to be dominating the number of new integrations at CES and otherwise. Surely, relaxing the hardware requirements makes it easier for hardware companies
War of the voice-enabled assistants

already considering either or both Alexa and Hey Google integrations to make an “Apple version” of their software as well.

On the other end of the spectrum (in terms of popularity), Samsung’s Bixby appears to be solely tied to the Samsung ecosystem, but that could be because Samsung appears to have elected a different strategy than Google, Amazon, and Apple. Samsung seems to be “playing nice” with its competitors to remain relevant (presumably there is a delicate balancing act occurring with Samsung’s Android phones being claimed by Google for their own digital assistant), weaving its SmartThings connectivity into your home via TVs, washers, dryers, refrigerators, and other home appliances.

Bixby’s main purpose, for the moment, seems to be to bridge you to Google’s Assistant or Alexa via a Samsung device. I found it a bit odd that Bixby wasn’t mentioned in any of Samsung’s robotics demonstrations for connected living. Outside of Samsung’s booth, hardly a mention of Bixby could be found, whereas Google Assistants dressed in white coveralls were often accompanying booths touting new Google-enabled products. Alexa compatibility has become the bell cow for whether your device is considered connected or not.

I find it kind of interesting that the digital assistant marketplace is made up of four companies that otherwise would be partners (and sometimes still are). Apple and Samsung are primarily hardware manufacturers and Google is a software company. But the most dominant presence for voice-enabled products, in my opinion, is Alexa, which is, of course, tied to a marketplace ... makes sense.

Now about that Alexa ... She gets around. From smart power plugs/outlets (Currant, Belkin, etc.) to cooking appliances (Whirlpool and Gourmia), ceiling fans, door locks, lighting and, of course, speakers and TVs, Alexa is everywhere – perhaps even where she might not be all that helpful. But what I’ve started to notice is that everything that was solely Alexa-enabled just a year or two ago is now also Google Voice Assistant enabled. In fact, looking at CNET’s two articles for new products at CES that are enabled for Alexa and Google, there’s basically no difference.

What’s more, Amazon has officially forayed into the hardware world beyond cheap speakers, encouraging consumers to allow Alexa to listen into every room of the home. They have now also funded a startup to produce ‘Smart’ glasses (Focals, by North) that will bring Alexa to your mobile person, and those weren’t even the only Alexa enabled glasses at CES. Amazon is clearly vying for some tech to close the mobility gap they suffer from without a platform such as a phone or car kit. While a bit far-fetched in terms of ubiquitous adoption, at least now Alexa can stay with you outside the house in some fashion.

There does appear to be a general theme amongst all the major players to be inclusive. If one of the platforms were to out-pace the rest, at least the obsolete brands’ hardware and products/services would still be relevant. What will be interesting for CES moving forward is to see if “playing nice” continues in the years to come.
Are we smart or overconnected?

By Erik Eagleman and Ryan Braunstein

What does it mean for something to be “smart?”

Making things smart was the name of the game for CES 2019. Key words like “Smart” and “Connected” were everywhere. At least at CES, it seems like the majority of “smart” consumer products are some kind of learning, adapting, self-adjusting or automatic function. It takes one less button to push for the product to work or do its function.

It most cases, this was voice-enabled artificial intelligence (AI) technology, and it’s making its way into anything you could possibly think of including outdoor table umbrellas, TVs, bicycles, and car stereos.

Alexa is no longer a voice-enabled assistance as much as she is just a computer chip, microphone and speaker that Amazon is selling to anyone who wants her. Alexa is being integrated into so many devices at such a quick pace it begs a few questions: is there no end to what she can do, and what are the repercussions for Alexa (or other AI assistances) to be in everything?

Security comes to mind and what kind of protection is being governed when so much is being implemented at such a quick rate. Not only can Alexa (and others) open your garage and unlock your doors, she can also open your wallet. You can order food or toilet paper just by asking her.
Are we smart or overconnected?

When so much trust is being given to this AI assistant, what is being done on Amazon’s side to assure that it is protected? It may be able to protect its own branded Alexa Dot, but when it comes to other devices, how can I be assured it’s not going to get hacked? There is little talk about this both at the show as well as on Amazon.com. I tried asking many staff members at the show but got the same umbrella answer, “It’s protected.”

When it comes to this new type of technology, we need to make sure that the security aspect is also being upgraded along with the new function. As cool as it may be to have a hands-free device helping you do something, it’s also cool to have peace of mind knowing it’s not taking everything you say to a huge database that could fall into the wrong hands.

It’s not only Alexa and it’s not only a system-wide issue. The thought that someone can hack your “smart” toothbrush, toilet or oven sort of seems like a “so what?” until you read about what can happen. For example, a hacker got the password for a California family’s Nest camera, got control of their smart devices and put up a fake warning that North Korea had launched missiles that popped up on their TV as they were watching a football game. They were terrified until some healthy skepticism kicked in.

More alarmingly, the majority of IoT device makers haven’t made security a top priority, according to recent industry surveys. Which leads us back to a simple question – do we really need everything to be connected?

There are some very smart engineers that have thought up some great excuses to bring some intelligence to the next generation of Moen showers, but wouldn’t it be just as good if it beeped at you in the bathroom to alert you that it had reached your preferred temperature? We’re not quite certain we want a piece of software (potentially buggy or hackable) to allow us to remotely turn on the shower via our smartphone (which Moen now claims you can do). Just seems we’ve taken “connected” further than really necessary and stretched the capabilities beyond what is actually useful.

Not to pick on Moen – it seems everyone is rushing to make products smart. It would be nice if they were useful and safe, too.
Droning on...

by Ryan Braunstein

Will the real Mavic please stand up?

The majority of drones exhibited at CES continue to be tilted toward hobbyist, outdoorsy uses. In particular, the foldable Mavic Pro of a few years back has clearly had an impact, as numerous me-too products have appeared. While I note that none of the foldables appear to be taking design cues from GoPro’s Karma (meant to compete with the Mavic), several of these fast-followers have taken a page from the Mavic’s form factor and size.

Take Autel’s Evo, for example (shown above); the drone is nearly the same size and layout as a Mavic, and while its camera has a wider Field-Of-View (94 degrees to the Mavic Pro 2 Zoom’s 83 degrees), it has largely the same feature set as a Mavic.
Droning on...

Yuneec added voice control to their foldable Mantis Q, and won an Innovation Award for it. Another Shenzen manufacturer named High Great had a copy of the Mavic as well, but their booth was more focused on demonstrating a drone swarm light show.

Taking Snapchat selfies to the next level, AEE has developed the Selfly, a drone in a phone case for your Android or iPhone. Selfly includes a camera that can record, livestream, and take photos in 1080p and 60fps, all packed into a case that’s still under half-an-inch thick, similar to an OtterBox (although perhaps not quite as robust if you should drop your phone).

Submersible Drones

As drone manufacturers search for another category to fill beyond hobbyist flying cameras, we have started to see more underwater drones, including the Navatics, MITO – they claim their stabilization software allows the underwater drone to make better use of the 4K 30fps video and 12MP stills (funded successfully by Kickstarter, no less).

There were several drones that swam like fish including one that mimicked a full-scale shark (left). Although the shark is complete with all-around obstacle avoidance, I was more impressed with (and much less scared by) the water-quality monitoring robo-fish by the same company, Robosea.

While some of these seemed like glorified submersible remote controls, there were a couple exceptions. Notably, PowerVision, previously known for its flying PowerEgg, has come up with a number of seafaring drones intended to find, track and even lure fish. Their PowerDolphin (right) can be equipped with “intelligent fishing” functions and...
they claim it can detect objects in real time within 131 feet. Equipped with an intelligent sonar device and GPS waypoint function, the drone is also capable of drawing underwater topographic maps.

Professional Drones
As the lines between hobby and professional photography drones start to blur, DJI has now released Enterprise editions of the Mavic that come equipped with flood lighting or a FLIR camera, presumably for finding warm bodies in closed city parks after sunset.

And several drone manufacturers, including DJI, are starting to branch out into agricultural uses, such as crop spraying. After talking to a couple farm owners about the viability of that application, I've learned that it usually requires a few thousand gallons of pesticides or fertilizers to spray a typical small farm, and while the drones built for this purpose tend to be much larger, they simply don't have a payload capacity to convince me of their efficacy.

The same can be said of last-mile package delivery solutions. Given the size required to carry a decent payload, these aren't little toys and could be quite dangerous if they were to hit something like a tree branch or power line unexpectedly. Perhaps for remote villages there might be a delivery application, and that's where several manufacturers seemed to be aiming their products with hybrid petrol engines or a mix of vertical takeoff/landing capabilities paired with wings and alternative propulsion for more efficient forward flight.

Also, in the interest of increasing range, Global Energy Transmission announced it had developed a remote charging system to allow battery-powered drones to fly indefinitely. By hovering over a pre-installed charging area, their wireless charging system would enable drones to fly between power stations along extended flight routes.
Before I get into the practical, I would like to make a brief mention of the ridiculous, at least in my opinion. Having logged more than 200 drone flights myself, I think the idea of using a drone to fight a high-rise building fire by firing a rocket packed with fire retardant seems like a wasted effort. First of all, try firing that into an open window while hovering just adjacent to a skyscraper – I'm sure the wind and smoke won't interfere at all with your aim. And back to the payload issue, even if you could spray water or foam from a tank, the drone’s payload limitations surely won’t do much more than put out a fire in your toaster.

So that brings me to the only drone I saw at CES that seemingly has a legitimate use beyond photography: Sunflower Labs home security drone. Sunflower has developed a drone and sensor array that detects unwanted visitors and enables the homeowner to deploy a live camera to presumably survey and deter the trespasser. I happen to know the CEO, so take my praise with a grain of salt perhaps, but the Sunflower system takes full advantage of autonomous tech while applying it in a space (home security) that seemingly has been lacking in innovation for decades. And obviously their tech can be applied to properties beyond the single family home, like just about any property that would otherwise require regular attention to deter theft (ie farms or nuclear power plants etc). But the best part of this home security system is that the system detects, deploys, and informs you-all before the delinquent has entered your home. Beat that Honeywell.

I think we are still in the nascent stages of finding how to apply autonomous tech to practical products, and that the drone industry exemplifies what we see throughout tech at CES and beyond – tech as an industry is often comprised of a single (sometimes lucky) innovator that sparks a smattering of copycat look-alike products. In the case of drones, the most successful products are relentlessly copied not only in function but also in appearance, as was the case with the DJI Mavic this year.

But drones are now being developed at such a rapid pace that there are new product categories popping up yearly, many of which will be dismissed as the market fails to adopt their innovations. But perhaps we’re just around the corner from the next Mavic Pro. So, I look forward to the next generation of novel uses for drone tech, and while I didn’t see anything I need for 2019, I’m eager to see what CES offers up in 2020 and the years to come.
Focals by North (an Amazon funded startup) seems to have taken a technological step backward to implement their new ‘Smart’ glasses. Gone is the spooky camera everyone is worried would violate our collective privacy, and also these glasses aren’t listening all the time. Alexa is enabled, but you have to use the included joystick/fob to get her attention.

Cool stuff catch-all
Cool stuff catch-all: Home tech

1. JER chocolate 3D pen, 2. Samsung Sante circadian rhythm LEDs, 3. Archibald connected garden, 4. Laika pet companion robot, 5. Yomee yogurt maker
Cool stuff catch-all: Wearables

1. onTracks Guide Watches, 2. NAMI printed sensors, 3. Elvie wearable breast pump, 4. Owlet expectant mother band monitor, 5. Telsa VR suit
Cool stuff catch-all: Personal care

1. P&G heated shaver,
2. Lumini by Lululab Inc., portable skincare assistant,
3. P&G skin discoloration device,
4. D free Tripple W incontinance device