

ECONOMICS OF

ABILITY

Baby to Bot: Future of the Ability Spectrum

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# METHODOLOGY

For this report, sparks & honey conducted primary research and interviewed experts in the field of ability, including thought leaders from our Influencer Advisory Board (IAB). We surveyed 1,009 people in the US, aged 18 to 65, to engage their perceptions on evolving technologies. Leveraging social listening, patent analysis, and our proprietary Cultural Intelligence system, we combed through thousands of signals to build a vision of the future cultural landscape of ability.

# CONTRIBUTING THOUGHT LEADERS



**Dr. Vivienne Ming**

**NEUROSCIENTIST,  
TECHNOLOGIST,  
CO-FOUNDER OF SÓCOS**

Dr. Vivienne Ming is a theoretical neuroscientist, technologist and entrepreneur who was named one of 10 Women to Watch in Tech in 2013 by Inc. Magazine. She's also a visiting scholar at UC Berkeley's Redwood Center for Theoretical Neuroscience, where she pursues her research in neuroprosthetics. In her free time, she has developed a predictive model of diabetes to better manage the glucose levels of her diabetic son and systems to predict manic episodes in bipolar sufferers.



**Dr. Andy Walshe**

**DIRECTOR OF  
HIGH PERFORMANCE  
FOR RED BULL**

Australian Dr. Andy Walshe is a consultant for business, sports and military organizations worldwide, including DARPA, an agency of the U.S. Department of Defense responsible for the development of emerging technologies for use by the military. Andy is also director of high performance for Red Bull's global athlete development program, where he works with hundreds of international athletes; supervises a team of industry-leading sports scientists, nutritionists, biomechanics experts and sports psychologists; and develops elite sports performance models.



**Jennifer Brown**

**CEO, JENNIFER  
BROWN CONSULTING**

Author of "Inclusion: Diversity, The New Workplace & The Will To Change," Jennifer Brown is an award-winning entrepreneur, author and sought-after thought leader on diversity and inclusion with more than a decade of consulting F500 companies under her belt. Her company, Jennifer Brown Consulting, LLC (JBC) is a certified woman and LGBT-owned consulting firm that guides leaders on the "business case for diversity" and whole organization systems change methodology.



**Geraldine Moriba**

**FOUNDER OF  
MORIBA MEDIA**

Our Multiculturalism, Race, Ethnicity expert Geraldine Moriba has devoted herself to making a difference around the subject of difference. This multiple Emmy and Peabody awards-winning VP of Diversity and Inclusion for CNN Worldwide, has been the executive producer of CNN's documentary series "In America" on the full range of American identities. She's also developed and launched 2 daily news blogs - NBC's The Grio and CNN's In America creating recognition for news stories that might have otherwise gone unreported.



**Alex Orlov**

**CO-FOUNDER,  
CSEEKER**

Alex was born in Russia and moved to Israel in 1990, before coming to the UK and gaining a B.A. in Graphic Design from Derby University. He has been Deaf since birth, and uses a cochlear implant. Alex has worked as an art director at a number of advertising agencies, and managed his own art and design studio before joining forces with his brother Guy (who is also Deaf) to set up cSeeker in 2014. cSeeker provides communication support across the educational sector, helping Deaf students and others reach their full potential. He lives in Birmingham, UK.



**Robin Farmanfarmaian**

**MEDICAL FUTURIST,  
BIOTECH ACTIVIST**

Serial entrepreneur Robin Farmanfarmaian is the author of "The Patient as CEO: How Technology Empowers the Healthcare Consumer," which discusses such technologies as wearable sensors, improved point-of-care diagnostics, artificial intelligence and robotics. Farmanfarmaian works at the bleeding edge of biomedical innovation to change the way patients manage their own health and interact with healthcare providers.

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**It's a hard time to be a human.  
Conversely, it's never been more thrilling  
to be a human, or part robot, than now.**

# THE CULTURAL TIDE TOWARD ABILITY

The world is no longer a simplistic divide of us versus them, or any other binary. Across the cultural tide, we're seeing how humanity is taking the place of the other – whether it's with gender, age, race, or even machines. At the same time, the rising populist nationalism, from the White House to Europe, poses an ever-tightening tension to these cultural shifts.

With these blurring lines, cohorts of people who have traditionally been in the periphery are being embraced in the mainstream. This cultural tide is evident in everything from freckles as the coveted look-du-jour in beauty to inclusive design permeating our urban spaces and products, or in broader social terms, parental leave aspirations for any composition of the modern family: whether same sex, single or married.

Policy is often slow to reflect these shifts in a non-binary culture, but eventually some pierce the bureaucratic bubble. In New York City, schools have just been mandated by the local government to address transgender students by their pronoun of choice—they, them, their, for example.



**The binary also limits us. Traditionally, we've thought of binaries with diversity, and inclusion: when we say "diverse talent" in organizations, for example, it is meant to refer to "minority" identities or those less-represented, whether it be race, ethnicity, gender, sexual orientation, or ability. This sets up an "us" vs. "them" dynamic, whereas the reality is more fluid, and becoming even more so, as identity blurs.**

**Jennifer Brown**

**author of "Inclusion: Diversity, The New Workplace & The Will To Change,"  
sparks & honey Influencer Advisory Board (IAB) member**

When we're not talking to, or about, each other, we're communicating through our intensely connected labyrinth of devices, wearables, and voice-assisted techy guides. And those devices are fueling human potential. In Adam Piore's new book, "The Body Builders: Inside the Science of the Engineered Human," he posits a world where bioengineers are harnessing technology to tap into unlocked ability in the human body and mind. Think computers translating neural brain patterns of your thoughts into words.

We're in an era of dissolving lines between human and machine. After all, you can brand yourself with a tech tattoo that automatically orders your favorite pizza (if you really, really like Pizza Hut), or swallow a wireless thermometer like the e-Celsius by BodyCap, designed to monitor your core temperature—from the inside out.

But these intimate connections blur the very boundaries, or binaries, of humans and technology. Where does one start and the other begin? Amazon has boldly suggested that its Echo be given First Amendment rights, when one was subpoenaed as a potential murder witness. If the Echo did record the final moments of a person's life, the digital imprint of their final moments takes on a life of its own. It may seem extreme, but we'll continue to see such lines blur between humans and machines.

The taboos are being lifted on old ways of living, by challenging our perceptions of the world we're living in, and will live in.

The same holds true when it comes to our physical or cognitive ability. Leaning on technology and design, we are in an era of augmenting, tinkering, and enhancing our abilities, whether cognitive or physical. We may be more alert or productive thanks to using a mediation app, immersing ourselves in environments constructed around nature, or boosting our physical endurance by altering our brain waves.

From the mundane to the futuristic, our abilities as humans (and machines) evolve throughout our days and lifetimes. This spectrum of ability is a constant reverberating tide that affects all of us, and moves culture.

# ABILITY = HUMAN POTENTIAL

The current political climate is increasingly highlighting the needs of anyone who is not an old, white male. There's a complex undercurrent of bias in current policy and government affairs, explains Dr. Andy Walshe, a human potential hacker who serves on the Science & Technology Board at Defense Advanced Research Projects Agency (DARPA). But against the growing tide of extremist politics, whether it's the rights to medical insurance, gender equality or immigrant policies at play, there is an ever-vocal groundswell of resistance against policies and stereotypes that pit one against the other. On January 21, 2017, over four million people marched on behalf of the Women's March—including the largest-ever gathering of disability activists (in the US), estimated at 45,000. As the socio-political climate continues to section the world into binaries, we can only expect for the voices of dissent to grow louder.

And here's why. The perception of who is able and who may not be able is connected to power and to the assumptions or stereotypes attached to such hierarchies and societal assumptions. One example is the differences in between the Olympics and Paralympics, which run in tandem. NBC's coverage focused on airing the Olympics, leaving Paralympian media exposure in the dust. Conversely, the UK's Channel 4 spot, a Rio Paralympics 2016 trailer called, "We're the Superhumans," was lauded for its impact and grit, showing more than 140 people with disabilities alongside athletes. Its "unbridled celebration of ability," as Channel 4's CMO Dan Brook told [Adweek](#), brought the breadth of human potential to audiences. At the same time, Paralympic athletes such as Gold medalist Abdellatif Baka, finished 1.7 seconds faster than Olympic champion Matthew Centrowitz. "A lack of inclusion restricts us all in understanding the full spectrum of human potential," said Andy Walshe, who is also a sparks & honey IAB member.



1 Billion

People globally who live with some form of disability – or 15% of the world's population.  
– *The World Bank*

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In this light, the idea of human potential, or simply, ability, is limited by fear. “For those in a position of power, this is fear of the unknown, of discomfort (real or perceived), of loss of status, or loss of control. For those without power, discomfort, lack of status, and lack of control are daily realities,” said Jennifer Brown, author of “Inclusion: Diversity, The New Workplace & The Will To Change,” and sparks & honey IAB member.

In a world beyond binaries, we are part of a vast, influential range of abilities, both cognitive and physical, that are constantly in flux and influencing one another. Whether we see it or not, we’re all connected, and all deserving of the spaces we occupy: from home to school to work. As we infuse our lives with technology and look to robots for companionship, entertainment and assistance, Ability, in this context, is about human and civil rights. And maybe even, robot rights.

It begs the question, what does tomorrow look like – for all of us?

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# ABILITY SPECTRUM

# THE ABILITY SPECTRUM

For the purposes of this report, we're posing a framework for understanding how culture is bringing a cohort who has long been on the periphery gradually into the forefront – by looking at the human condition on an evolving spectrum of ability. We are championing a world that embraces people of all abilities, understanding that we're all on one spectrum of ability.

Our abilities – physical, mental or communicative – are all on a range. None of us are the same. We are born one way, and the only certainty is that our ability changes over time. Consider such people as 83-year-old Ruth Bader Ginsburg who is still active on the bench, but works out harder than most millennials. Or, YouTube's Mandeville Sisters, one of whom was born without a hand, who humorously address discrimination issues or the “perks of living with one hand” to their over 100,000 subscribers.

Young, old or differently abled, our worlds have grown to reflect a certain homogenized experience of being human: from urban planning and transportation, to product design and service availability.

But these constructions often discount a large portion of the global population. On the other end, we're looking toward a future—evident already in our lives today—where ability can be enhanced, morphed, designed and modular. For some, this is and will increasingly be, a necessity, and for others, a luxury. We may not be aware of it, but we've been morphing our ability for some time: such as with pacemakers, a tech tattoo for diabetics that measures glucose levels, or bionic limbs. On one end, this body morphication helps us live longer or enhances our wellbeing. On the other, a runner may perform faster in prosthetics than his fellow athletes.

There are cultural forces reverberating across the spectrum of ability in a number of mega trends we follow here at sparks & honey, such as unapologetic, frictionless and AI ethics. In this report, we examine the pervading tide of culture through the lens of ability, affecting all of us.



Superhuman, super fast

# CULTURE EMBRACES THE FEARLESS



Take a look around. People across the ability spectrum are slowly gaining visibility across culture. In the US alone, there are 56 million Americans, or 19% of the population, who are living with some form of a disability—physical, mental or communicative—according to Census Bureau data. Beyond our nation’s borders, those numbers skyrocket to a collective one billion people, globally. The people behind these numbers have long gone unnoticed in the mainstream, but the changing perceptions of human ability are also helping us understand their vast cultural influence.

4 X more

Models aged 50 or over worked the runways of New York Fashion Week's Fall 2017 shows, compared to the previous season.  
- *theFashionSpot Runway Diversity Report Fall 2017*

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Whether in policy, art, fashion or media, the ability spectrum is evident in trends we track at sparks & honey: unapologetic is about boldly owning and presenting who you are, an attitude we've seen shift among generations. It's evident from beauty campaigns to New York Fashion Week's Fall 2017 shows, where models of all ages walked the catwalk. This season, four times as many models over the age of 50 were employed in the Fall 2017 shows, compared to the previous season, according to [theFashionSpot's diversity report](#). Gracing Simone Rocha's runways, 72-year-old Jan de Villeneuve was one of them.

Or, it's the paraplegic man and his wife who announced their pregnancy to friends with a photo and the words, "it still works" scrawled on the wall behind them. And those who build our worlds are creating innovative user experiences that remove needless complexity from simple tasks, such as opening a cabinet. Embracing the unapologetic—whether in art, fashion, design or technology—is a natural connection to people across the ability spectrum.

The mindset of our youngest generation, Gen Z, exemplify this cultural shift. They actively see the world through a collective lens: it's the kids and teens of today who are the unapologetic champions of humanity. Take the 13-year-old best friends, one Muslim, one Jewish, who dressed us as "[Juslim](#)" superheroes for Halloween. They're part of a growing multiracial youth population, which has increased 50% since 2000. As Gen Z grows up, they absorb the norms of acceptance in their culturally rich world and home. Instead of the "other," it's about all of us, Gen Z says.

**FASHION-  
ABLE**



Models of all ages graced Fashion Week runways

# THE AESTHETICS OF ABILITY

We process our surroundings by absorbing their look and feel. In art and fashion alike, the intangible – our emotional responses – are translated into objects of desire we wear or experience, that can help us understand one another on a more profound level. What was once high brow and very exclusive is now reflecting a changed world.

At New York Fashion Week, models of all ages and abilities graced the runway, from 18-year-old Australian model Madeline Stuart, who has Down Syndrome, to Jeremy Meeks, whose brooding mug shot launched a modeling career. Inclusivity is permeating everything from the faces of fashion to the clothes we wear. Online retailer Everlane launched its [100% Human collection](#), a 'brand as activist' message that flattens any divide between genders, races or geographies.

For every \$100 spent on its 100% Human line, the company donates \$5 to Equality Now.

In the Ukraine, model Alexandra Kutas, 23, headlined in a Kiev fashion show in couture dresses which she wore in her wheelchair. "People are not all the same – we are all different in this world," Ukrainian designer Fedir Vozianov told [FashionUnited](#).

The vibe is distinctly unapologetic and inclusive, and it's percolating in the fashion arena. Fashion and art are materializing to represent people of all abilities, from young to senior, and across life circumstances. In that process, they're influencing what everyone wears – or wants to wear.



The title '2016, 2017' is rendered in a large, stylized font. The numbers '2016' are in orange, and the numbers '2017' are in white. A dashed white line runs diagonally across the text, with a white scissors icon positioned at the intersection of the line and the comma. The background is a solid purple color.

Fashion designers employed in the US  
- IBIS, Fashion Designers Market Research Report, 2016

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# ADORNING THE HIDDEN: THE BODY AS A CANVAS

In fashion and beauty, there's a continuous tension between two ends of the aesthetic spectrum: the minimal, bare-bones neutral chic—no makeup, monotone palettes, minimalist designs—juxtaposed to the brightly colored, fur-lined, loud looks popularized by brands such as Versace, or the '70s to '80s.

Whatever your appeal, you're communicating a sensibility through an aesthetic. In the mainstream, au naturel Alicia Keys has famously been bare-faced for over a year, while maximalists such as YouTube's PolishMountain, where applying over 100 coats of nail polish has attracted over 15 million views, portray the maximalist look.

Whether maximalist, minimalist or somewhere in between, we're finding new ways of self-expression using our bodies as a canvas, reflected in the trend of perceptual diversity. Honing in on a specific area of the body aesthetically, such as earlobe makeup or fingernail art, could be seen as a subtle cue of self-empowerment, or singular cosplay blended into the everyday. Your body becomes a canvas that tells its own story, one that's adorned, painted, tattooed.



The body is a canvas that tells its own story



Influencing this trend are the people who have chosen to highlight their unapologetic physiques, with stunning visual effect.

Michael Olajide, Jr. is a renowned trainer in the fashion world, whose clientele includes models such as Adriana Lima. A former champion boxer, Olajide is blind in his right eye and wears dramatic eye patches of horus design or steampunk metal, creating a maximalist vision of his lack of vision. “Bionic pop star” Viktoria Modesta is a multimedia performance artist and singer, whose customized uber-modern prosthetics inspire as much as her performances do. Instead of veiling these specific parts, Olajide and Modesta transform them into powerful, visually stunning fashion statements.



# COMMUNICATE THROUGH CLOTHING: TELL ME HOW YOU FEEL

From sweats to evening attire, we use clothing to either cover or accentuate the parts of ourselves we want to expose to the world. However you may feel or want to move, your outfit can speak for itself.

The strong connection between fashion and mood state suggests people should wear clothes they associate with happiness, according to a study by the School of Psychology at the University of Hertfordshire in the UK. But now, fashion has caught up to our internal dials and can express or help us regulate or enhance our cognitive and physical abilities.

Kids and adults alike can wear compression t-shirts to help them stay calm and focused throughout the day. Designs such as the Sens-ational Hip Hugging Tee provide deep pressure to parts of the body that are meant to calm its wearer. Innovations in fabric design are helping to bridge the emotional connection between a garment and wearer. German fashion design student Babette Sperling created a clothing collection that incorporates braille notes—the written language for people with blindness—using 3D printing technology. Each item contains a hidden message embedded in the piece, adding a layer of extrasensory intrigue and emotion.

73.5%

For many US consumers, mood-based clothing may still be too revealing. 73.5% of people want to communicate how they're feeling through speech—and not technology or their clothing.  
- sparks & honey

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Beyond emotions, what we wear can build on our physical abilities, too. Smart shirts such as the Polar Team Pro Shirt (introduced at CES this year) are set to compete against performance-enhancing wearables that you might attach to your wrist or track on your phone. This smart running shirt is embedded with fabric sensors that can monitor your heart rate, track your motion, speed, distance run and just how fast you did it all.

What may be a fashion statement for some is a therapeutic companion or performance builder for others. These ability-enhancing items could be hanging in your closet.

415%

Of US consumers are interested in using clothing with sensors that can detect diseases, conditions or ailments.  
- Mintel, *For the Blind to See*, 2017

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# TAKING FRICTION OUT OF FASHION



Think of what you put on this morning: how many zippers, buttons or strings did you have to pull just to get dressed? What may be tedious for some is prohibitive for others, in the routine of getting dressed. Consider people who may not have strength in their hands or even a cast on a limb. For this cohort, fastening a simple button is an example of a trend called premium friction, where a task is purposely made more cumbersome. But many designers are simplifying the act of getting dressed, with appeal that extends across the ability spectrum.

In 2016, Tommy Hilfiger launched his adaptive clothing line for kids, Runway of Dreams. The line's clothes are similarly priced and styled to his other children's clothing. The line substitutes zippers and buttons with magnetic clasps, and includes wider top and leg openings. One of the first major brands targeting friction-free kids' fashion, the line has attracted a broad audience of kids and shopping parents. Last year, Runway of Dreams accounted for over 20 percent of all children's clothing sales, according to the Wall Street Journal.



**People with disabilities are a \$220 billion-dollar industry and they are still virtually ignored.**

**Dr. Danielle Sheypuk,  
psychologist, model, disability-rights advocate, sparks & honey IAB member**

# DESIGNED FOR GOOD

Spaces and places for all-ability

# DESIGNED FOR GOOD



Creating a world where people of all abilities are embraced starts with design and infrastructure that emphasize the human in all of us. Such inclusive design is about putting the person at the center of everything, whether it's the utensils you eat with, your mode of transport or the spaces you move through. From the homefront to the workplace and beyond, the lives of people across the ability spectrum have the potential to be enhanced with creative design solutions.

Designing for people of all abilities opens up wellness design for everyone—in an ideal world. Such inclusive design, increasingly taught in design-centric curriculums, is a pathway to converge the spectrum of ability across our cities, schools, transport systems, workplaces and park benches.

It's a future that hinges on a united vision of people living in ever-closer proximity to one another. By 2050, the UN estimates that 66% of the world's population will live in cities. Increasingly, many of those residents will be in megacities, defined as urban centers with more than 15 million residents. Such tightly knit quarters will not only mean we might get to know more of our neighbors, but it also challenges our urban and UX designs, as we build up into new air spaces, (even to the moon, if Elon Musk has his way), or underwater.



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**If you design cities that are friendly  
for the aged, it works for all people.**

**Dr. Ruth Finkelstein,  
Associate Director of Robert N. Butler Columbia Aging Center,  
sparks & honey IAB member**

# INCLUSIVITY IN THE CITY

Inclusive design gives a voice to that which you might not see otherwise. In the UK, a wellness design effort by Transport for London, (TfL), emerged in the form of blue badges you can wear on your lapel. In September 2016, TfL introduced its “please offer me a seat” badges for passengers who have conditions or illnesses that are not immediately visible. And thanks to a campaign by Maltesers, the city has also seen its other public surfaces evolve to embrace those on the periphery. In January 2017, the sweets brand launched Braille billboards in a bid to champion inclusivity in open spaces and the media.





Wellness design welcomes people of all abilities



**The first step to inclusivity and genuine political correctness is to stop avoiding certain words and just take it easy. “Inclusivity” for “disabled” makes life easier for the abled, too.**

**Alex Orlov,  
Co-Founder of cSeeker, who is deaf**

# CHANGING BEHAVIORS, CHANGING CITIES

Urban design is responding to our behaviors and abilities, which are rapidly changing thanks to our keen attachments to tech. Every minute spent hunched over a screen adds up, and eventually our bodies either adapt or develop what we call technomaladies, ailments as a result of our tech-infused existences. Teens are developing pains previously seen only in the older population, such as a stiff neck, known as text neck. And we're less likely to pay attention than we were just ten years ago: the human attention span has shortened from 12 seconds to eight seconds, according to a [study](#) by Microsoft.

Changes in the way we move through spaces are being reflected in our environments. In London, there's now a [Direct Lane](#) for pedestrians who have places to get to—quickly. The Direct Lane supports walkers who move at speeds of at least three miles per hour, although the speed of your stride may be hard to regulate. In the other lanes? The texters, the YouTube viewers, or other casual strollers. In Germany, the streets are evolving to adapt to our lower-gaze eye levels. The cities of Augsburg and Cologne were concerned with the growing number of citizens glued to their devices while walking and ignoring red lights. They installed traffic lights—on the sidewalk. If we untether ourselves from the grasp of technology, will we start to look forward again? Or, perhaps up—at the drone passing by in our air space.



**You are not confined to a physical venue to do anything anymore – from your jobs to services and relationships.**

**Robin Farmanfarmanian,  
biotech activist, author of "Patient As CEO", sparks & honey IAB member**

# COMMUNITIES DESIGNED FOR SPECIFIC ABILITIES

Urban areas are being designed as nurturing environments for people of varying abilities, such as Hogeway, a community designed specifically for people with dementia. On the outskirts of Amsterdam, the community has the staples of any small town—a post office, a town square, gardens and park benches. Its 152 inhabitants, however, are followed closely by cameras and caretakers who dress in street clothes. The semblance of a routine life, designed for their particular needs, helps this population whose abilities are in flux. A similar “Dementia Village” for 100 people is currently being built in Italy, as well.

**66%**

**World's population predicted to be living in cities by 2050**  
- UN, *Division for Social Policy and Development Disability*

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# BRINGING THE OUTSIDE INSIDE



If our attention spans are shortened, we're also looking for quick-fixes to digitally detox in any environment we're moving through. A breath of fresh air during lunch time may fill your lungs, and any other time spent in greenery can enhance our wellbeing, on cognitive and physical fronts. In Spain, kids who spent time climbing trees and playing games on the grass saw their mental abilities flourish, according to a [study](#). The more connected we are, the more we'll need to recharge with greenery to enhance our cognitive abilities. In Japan, that comes with the practice of [forest bathing](#), or simply being in the presence of trees, which is said to lower blood pressure, reduce stress hormones and overall, fuel the 'bather' in feel-good vibes. Nature is the next aspiration—and now we're bringing it indoors.

30,000

Number of lettuce heads farmed every day  
by a robot-run indoor vertical farming  
company in Kyoto, Japan.

- *Treehugger*

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# GREEN GIVES YOUR BRAIN A BREAK

It's no mistake that the 2017 Pantone color is a shade of green, verdant. The hue reflects our desire for green life in the spaces we occupy to benefit our wellness. A garden or a desk plant are our green friends, but we're also seeking completely immersive nature experiences. To serve that need, Pantone has partnered with Airbnb to fill a home with plants and projects to match its shade. Imagine, a tropical-themed bathroom or a bedroom, with a lawn to temper your barefooted toes at this "home," as the ultimate in feel-good digital detox.

Work spaces are also catching on to the cognitive and ability-enhancing benefits of greenery. Integrating nature views into the workplace has wellness benefits that translate to savings: a business can save over \$2,000 per employee annually in office costs. Architects at Selgascano in Madrid, Spain don't have to find nature when they work in it—their office is built into a sunken forest floor. Being surrounded in plant life and nature is said to fuel creativity, and the group has taken that concept and designed a coworking space called Second Home for creative companies. The space includes over 2,000 individual plants and trees from 100 different species. The space has a mentally restorative effect by releasing our fatigued brains from the energy that we spend on tasks that require direct attention, as detailed in Fast Company.



Relax, it's green



**Biophilia = the innate human  
attraction to nature.**

**The Economics of Biophilia, Terrapin Bright Green**

# SHOP IN THE SLOW LANE



Tesco grocery has an extra-slow checkout lane at its Forres, Scotland location, “the relaxed lane,” where people can take their time getting through the mundane task of buying food. Many people, some who have dementia or social anxiety, for example, find such tasks daunting and the grocery chain wanted to take that added stress out of their day. The staff manning the checkout are specially trained to deal with people of all abilities – and speeds. On the other hand, everyone is welcome to use the relaxed lane. It could also appeal to anyone glued to their device, choosing the slow lane to unwind while stocking up on the essentials.



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**“Easy to open” is the most important factor influencing food and drink packaging choices in the UK – across all age groups.**

Mintel, Packaging for Seniors



Frictionless product design can ease anxiety



# DESIGNED FOR EMOTIONAL COMFORT

Design concepts that focus on the user's wellness can also ease anxiety. This is true in everyday situations, like a busy grocery store, as it is in more confined spaces. In Norway, a group of students at the University of Bergen tackled the anxiety many prisoners feel in their confined spaces with furniture designs made to lessen their anxiety. Their furniture design prototypes, displayed at the Stockholm Furniture Fair, included prototypes such as an S-curved mattress that promotes relaxation, or a chair made for the "post-release environment" that makes the sitter feel safe and protected, yet fully in control of the piece. While designed for inmates, these emotionally nurturing daybeds, lamps and chairs would be attractive pieces for anyone's home, or cell.



# WHERE A NEED BECOMES A LUXURY

The appeal of user-centric design can become an aspiration, or a luxury, taking away from the people who may need it more. The team behind a concept apartment for older people, on view at the London Design Museum, redesigned basic household appliances and items to cater to an aging population. Designed by Future Facility, they pared down the basics, such as washing machines and cabinets, for a futuristic user-centric home designed to improve the lifestyles of its inhabitants. And its minimalist, sleek, out-of-eyeshot design is appealing across the board.

Similar designs have been created for aspirational lifestyles of millennials who may not live in one place too long, but desire all the comforts of home with modularity. These homes contain features such as hidden cabinets, moveable walls and pull-out tables, all of which can be easily changed for varying needs of space. Hong Kong architecture firm LAAB created such a modular smart apartment for its clients, where entertainment space turns into a sleeping zone, or a gym, in a few swift moves—in a 309 square foot apartment.

**\$12,400**

**Cost of the most high-end prosthetics  
made by the Alternative Limb Project**  
*- Lost At E Minor*

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This flattening of design, whether in spaces or products, for people of all-ability, can easily morph into a luxury. But on the crux side, designs that create wellness for some are often packaged in minimalist, modern designs that really, anyone would want. The price tag of such items often signifies aspirational luxury. This may price-out those who actually need an item, as opposed to those who may simply covet it.

**1.3** Billion

The number of people globally who face dexterity, cognition or sensory issues. Equivalent in size to the population of China, this group has an annual disposable income of \$1 Trillion.

- *The Vision A/W 18/19: Worldhood, 2016*

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**Practice the art of Japanese forest  
bathing for feel-good vibes**

# EMPATHY TECH

Understanding the intangible through tech



**Technology is hope.**

**Robin Farmanfarmaian**

**biotech activist, author of "Patient As CEO," sparks & honey IAB member**



# EMPATHY TECH



The speed of technological development can quickly leave us humans trying to catch up. But what we may find quirky or intriguing in the new, can just as quickly become a necessity in daily life for some. Calling out to Alexa, for example, can be a voice-assisted lifeline for those who may be restricted with physical abilities. At the same time, it's a quirky friend who responds to your playlist requests for others. Technology at its best helps us understand one another better and we can gain the eyes to see another's world more clearly.



Wearables may be fun for some, and a necessity for others

# DISCONNECTING HUMANS



At the other end, there's a tension that these very technologies are making us more emotionally disconnected from one another. The presence of technology can escalate our expectations of what it can do for abilities—and what it does to others. “Easier technology solutions can lead to less tolerance towards disabilities, less patience and more anxiety. There's an attitude of ‘come on, why don't you just go and fix it?’,” said Alex Orlov, founder of cSeeker, a UK-based company that provides communication support to the educational sector to help deaf students.

Developments in facial recognition to emotion-detecting technology—which can provide real-time updates on what you're really thinking—may make us want to hide from it all—and each other. In [The Guardian](#), writer Catherine Shoard posits that tech can be an invasive intruder, which will “ruin our social skills, friendships, relationships” and more.



**Sometimes employers or onlookers doubt an invisible condition exists are suspicious that it's an attempt to gain special treatment. How can people with invisible disabilities better communicate the nature of their circumstances?**

**Geraldine Moriba**

**founder of Moriba Media, former VP of Diversity and Inclusion for CNN Worldwide**

# AUGMENTED UNDERSTANDING

At the same time, benefits abound for many users of augmentative technology. Dr. Vivienne Ming's expression recognition system, FaceMaze, improves empathy in autistic children. "Without the training in learning to read expressions, they simply lacked a means of understanding the motives of each other," Dr. Ming said. The key, she maintained, is designing such technology with the right intention.

"Augmentative tech should only provide what we need to grow—it should only complement and not replace."



**We now understand that identity lives on a continuum, and it is as much about our invisible characteristics as it is about our visible characteristics. That we have power over what we “show”, to a degree, and it’s about trust.**

**Jennifer Brown**

**author of “Inclusion: Diversity, The New Workplace & The Will To Change,” sparks & honey IAB member**

# EMPATHY TECH TO UNDERSTAND



The trend of empathy is evident in tech that can allow us to understand another person's emotions or expressions. A complex, nuanced emotion is given life in an empathy-building app designed by MIT. This wearable allows you to detect emotion in a conversation. Every five seconds, its neural networks analyze a person's speech and vital signs. The data is then used to determine whether the chat you just had was "happy" or "sad" in tone. In its infancy, the app will be developed to encompass more complex emotion-detecting patterns. For those who have challenges reading other people or understanding emotions, such apps could mark the beginning of richer communication and a broader understanding of one another.



**What if you could give a child  
with autism a superpower?**

**Dr. Vivienne Ming**

**theoretical neuroscientist, technologist, entrepreneur, and sparks & honey IAB member**



# SHAPESHIFTING EMOTIONS

Beyond what you express to the world—or choose not to—your emotions, feelings or personality traits can take on physical forms that can help others quickly ‘get’ you. And more importantly, help you ‘get’ how the people in your circle are shaping up. In this sense, mood itself could be seen as an ability.

Interdisciplinary artists Kayla Mattes and Justin Seibert created a website, [The Shape of Things](#), which prompts users to answer 24 questions that are used to design a unique “shape” applicable to your personality. Mine turned into a scorpion-like shape in a pattern of black and blue squares veering into rectangles. When someone asks, “how are you,” your response can be handed over in this personality-tech sculpture.

A visual cue to our internal dials is also present in projects such as architect [Federico Babino’s ARCHIATRIC](#) series, in which he illustrates 16 mental illnesses, interpreted through various architectural forms. His image for Bipolar, for instance, is a house clearly sliced in half, with a monotone black on one side, and a chaotic, joyful series of uneven circular shapes habiting the other. Babino says his work is “a reflection on the prejudices and negative stigmas with which the pathologies of the mind are often observed,” as told to Designboom. A picture may tell a thousand words, but increasingly, a distilled version of our complex emotional states, too.

47.9%

The thought of someone reading your mind with a device is unnerving to many.  
47.9% say they would never want anyone to record their thoughts or moods.  
- sparks & honey

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# THE EMOTION MARKET

The perhaps unnerving ability of other people to read or interpret our moods or thoughts might be an anxiety-fueling prospect, but less so if we feel in control and understood by our environment and the people in it. When we enter a home, the lights may respond to your presence by turning on, but they could do much more. “An Internet of Things mesh network that makes up a home or office could offer much more to a user if it understood their feelings,” said Dr. Vivienne Ming.

“Commoditizing (our emotions) isn’t all bad, if I’m an informed participant in that ‘emotion market,’” said Dr. Vivienne Ming. Instead of a tech-focused environment where our machines communicate with us, we communicate with them. Dr. Ming calls this the “Marketplace of Things,” and not the Internet of Things, as it’s commonly known. But advancing toward such a model means we’ll have to think differently of our place in a machine-built world. “It will require some significant changes in the model of how we interact with the technology providers,” Dr. Ming added.

# MAKING MACHINE FRIENDS



We may trust our friends and loved ones, but turning to AI or robots for warmth or empathy we'd otherwise expect from our fellow humans is an alien concept for many, but one we're getting accustomed to. The expectations people have of turning to AI for emotional comfort vary. We asked how people felt about turning to AI for comfort (such as speaking to a voice-commanded machine) and the majority skewed positive to neutral in that sentiment, at 51.5%, while just under half, or 48.5%, indicated they had negative feelings about it.

While cozying up to machines is new to many, 'warm' technology will play an increasing role in expanding our physical and emotional abilities. After all, small drones are becoming sophisticated enough to change your light bulbs and voice-assisted services will become as much of a lifeline for many, as they are a source of intrigue.

You may ask a friend or service provider for help, but why not a machine? The machine could always follow you around, like the Vespa-designed cargo robot, Gita, who can be programmed to trail in your footsteps and carry up to 40 pounds of shopping, gym gear or other cargo for you.

38%

**A robot is a helping hand: 38% of people would prefer to use a robot companion for specific tasks, such as carrying things.**

*- sparks & honey*

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# SUPER- ABLED

Born to be bionic

# SUPER-ABLED

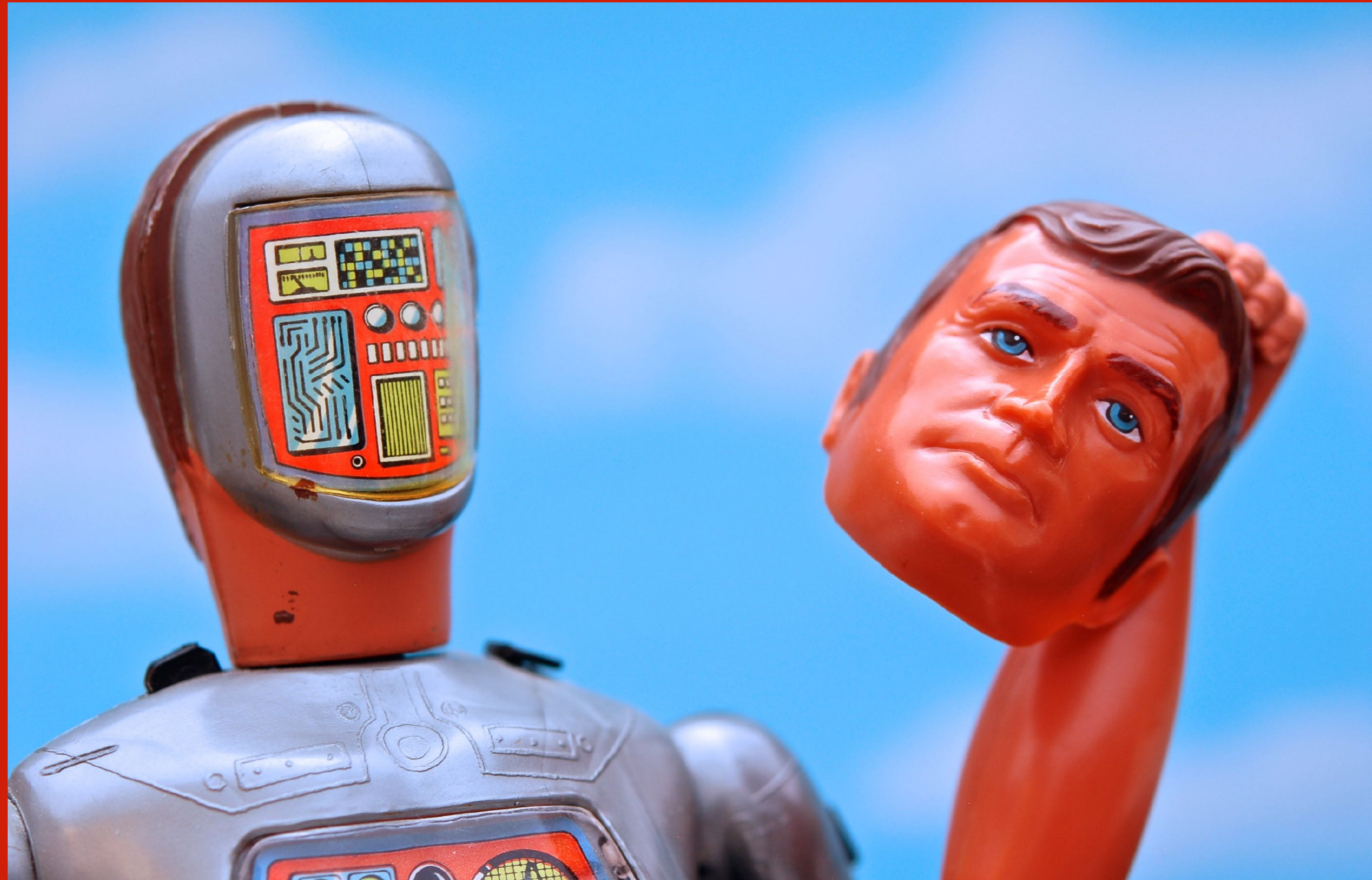
On the spectrum of ability, morphing, tweaking or adding to your body can give you abilities previously unimaginable, or super-ability. We're already super-abled in ways you probably take for granted. Contact lenses or pacemakers allow you to see and maintain your heart rate. By this definition, many people are already 'bionic,' by morphing their bodies with technology. This assumes that the 'super' is seen against that which is our natural, unaltered selves. But does that mean someone with a cochlear implant, a pacemaker or even a digital tattoo is super-human? Medical futurist Robin Farmanfarmanian says, "We are already bionic."

Like humanity, the line between robot and human is blurring by the day. A biomimetic artificial skin layer, for instance, is a material that can sense change in temperature with more sensitivity than actual human skin. Developed by researchers at the California Institute of Technology and the Swiss Federal Institute of Technology, the material could be seen as a kind of super sense, more sophisticated than its human-only inspiration.



For children who are homebound by severe illnesses, a telepresence robot can attend classes for them, while they're safely at home with robot controls in hand as they learn. For these kids, the telepresence robots are a very extension of their being. For athletes participating in the world's first Cyathlon, a sporting competition designed for people with severe disabilities, bionic could mean winning in the Powered Exoskeleton Race. You may have to wait and see for yourself until the next Cyathlon in 2020, however.





The line between robot and human is blurring by the day

# TALK ABOUT 'SUPERHUMAN'

While technology develops faster than we mortals can keep up, we are still finding the words to describe a world where man and machine meet, blend and work together to create alternate abilities previously unseen.

Over  Million

Mentions of “superhuman” in social over the past year

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In our analysis of social conversations around the topic, we found that people often discuss “superhuman” in relation to terms such as ‘strength,’ ‘powers,’ ‘abilities,’ and also ‘games.’ People connect the term to positive connotations of enhanced abilities, which is also seen in relation to the response to the Rio Paralympic Games trailer, *We’re The Superhumans*.

While there is conversation around science fiction and “superhuman” in the fictional sense, there is also discussion of the superhuman powers and abilities that already exist within us. In the context of gender relations, women were granted the superhuman moniker, “Women are superhuman.” And the term was also applied to the idea of enhanced skills that are exceptional or optimized, such as, “These students have superhuman abilities.”



**Patents filed under superhuman and biohacking technologies have nearly doubled from 2005 to 2015, showing a growing interest in innovation around the space.**

**At the same time, there was a decline in the number of superhuman biotech patents granted between 2013 and 2015, indicating a possible shift in changing attitudes around biohacking.**

# NEW COHORTS OF HUMAN



This future is closer than you may think and we could see it manifest into the formation of new cohorts of humans. Some are taking this to extremes in the form of bodyhacking, a microtribe of people who view the body as a “vehicle to be tuned, modified, added to, taken away from, painted, tweaked, and customized,” according to [BodyHackingCon 2018](#). From training your brain elasticity with software to cybernetics and implanted wearables, bodyhacking challenges our comfort level with the proximity of technology, when it’s a tangible part of our bodies.

Every minute of the day, we’re already quantifying everything, from the steps we take (or don’t take) to our sleep patterns. Brainwave-altering headsets can help us perform or focus better in athletics or other high-pressure situations. Or, we are increasingly able to outperform, or simply perform, by adding robotic limbs to our bodies.

“This evolution is going to lead to the collision of biological and synthetic technology and hardware,” said Dr. Andy Walshe, human potential hacker and Information Sciences & Technology DARPA advisor. “This will manifest in another generation of humans and I see the community of people with disabilities as one area where many of these ideas and concepts are going to be pioneered.”



**Technology evolves so quickly that our ability to adapt to it as humans leaves us behind. How can we continue to help make people more powerful – and not just the technology?**

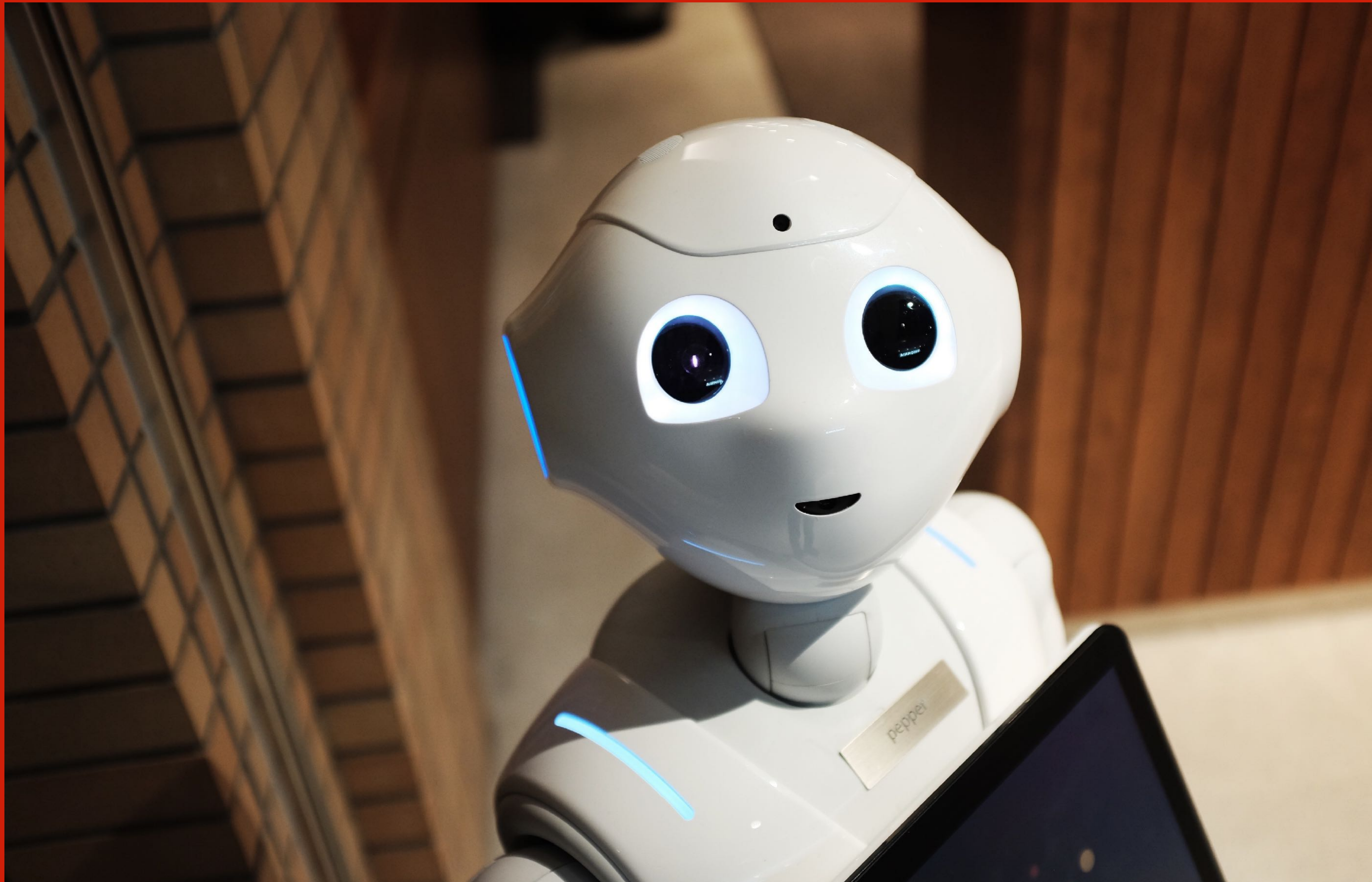
**Dr. Vivienne Ming**

**theoretical neuroscientist, technologist, entrepreneur, sparks & honey IAB member**

# THE FUTURE IS SUPERHUMAN

With ever-sophisticated algorithmic and computational models that can do things mere mortals would take a lifetime to accomplish, we're becoming more abled as a result. From the clothes we put on in the morning to the mattress we sleep on at night, technology is blending in with our everyday lives to enhance our abilities. Similarly, our machines are taking on human-like qualities, whether it's robots who have expressions that look like your friends, a Hugging Face chatbot that turns into a confidant, or AI that allows robots to ask us questions when they're confused. Technology is fueling a future where we may become more powerful, or physically and cognitively abled humans—or machines.





Our machines are starting to look like us

# THE TEAM

TITLE: ECONOMICS OF ABILITY  
SPARKS & HONEY REPORT

reports.sparksandhoney.com  
@sparksandhoney

**Anna Sofia Martin**  
Editorial Director

**Camilo La Cruz**  
Head of Content

**Terry Young**  
CEO & Founder

CREATIVE & EDITORIAL

**Eric Kwan Tai Lau**  
Associate Creative Director

**Purva Michaels**  
Senior Visual Designer

**Barbara Herman**  
Senior Writer

RESEARCH & CULTURAL INTELLIGENCE

**Anna Rosenblatt**  
VP, Cultural Strategy

**Olivia McLean**  
Cultural Strategist

**Annalie Killian**  
Director Human Networks

**Merlin U Ward**  
Director of Cultural Systems

AGENCY & CONSULTANCY

**Paul Butler**  
Chief Operation Officer

**Sharon Foo**  
Client Partner

**Tim Ettus**  
Managing Director, West Coast

**Tom Baran**  
Director, Business Development

# METHODOLOGY

For this report, sparks & honey conducted primary research and interviewed experts in the field of ability, including thought leaders from our Influencer Advisory Board (IAB). We surveyed 1,009 people in the US, aged 18 to 65, to engage their perceptions on evolving technologies. Leveraging social listening, patent analysis, and our proprietary Cultural Intelligence system, we combed through thousands of signals to build a vision of the future cultural landscape of ability.

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