

Will robots ever be better caretakers than humans?

A growing industry is betting on it.



[Photo: ElliQ]

BY RINA RAPHAEL

10 MINUTE READ

At the Aging Into the Future conference, a tech expo dedicated to innovation in elderly care, dozens of interactive booths beckoned investors, healthcare specialists, and senior citizens. There was a stationed driverless car, VR tutorials, and hands-free orthopedic shoes that open and close on their own.

But only one booth had a line. Attendees stood patiently, every so often oohing and aahing over the featured device. Some turned to strangers, remarking, “Isn’t this just the cutest?” or “That’s just incredible.” Others asked when they could purchase their own.



[Photo: Tombot]

The booth’s star attraction? [Tombot’s Jennie](#), a robotic Labrador retriever puppy who moves and nuzzles just like the real thing. It doesn’t pee, eat, or even bark. All this fake furry thing does is cuddle. “People really respond to it,” says Tombot founder Thomas E. Stevens. “But it’s not a toy. It’s a medical device providing a health benefit.”

Tombot is one of many startups selling robotic companions for senior citizens, offering emotional support, day-to-day assistance, or remote monitoring through artificial intelligence. Though these robots are often met with enthusiasm from consumers and medical experts alike, the companies selling them find themselves navigating a host of complicated issues: How do you best design robotic devices to take care of aging populations and encourage people to actually use them? How do you create something that is genuinely helpful, without it feeling creepy? Can robots ever truly replace human caretakers?

ADVERTISING



FILLING THE CARE GAP

The United States has 46 million senior Americans—a number that is expected to double by 2050 as older Americans grow to 22% of the population, [according to the Pew Research Center](#). At the same time, the U.S. healthcare system is bracing for a [shortage of caretakers](#), nurses, and medical professionals. Add in a strict immigration policy [and low birth rate](#), and some would argue that it makes sense to depend on technology to fill the care gap—and as such, little robot helpers.

“There aren’t people around to give care,” notes Deborah Carr, an aging expert and author of *Golden Years?: Social Inequality in Later Life*. “We’re getting to this point where desperate times require desperate measures.”

Elder care robots have flourished in places like Japan, which has the world’s oldest population. In the United States, senior citizens may rely on mobility aids or an Amazon Echo as they age. Google Home and Amazon Alexa advertise a lot to the elderly showing the breadth of their technologies’ use. That’s important because not all older adults are the same, explains Carr. Some want help with medications, others just want to know the weather or sports scores.

“We often think of older adults as one population—there are actually many varied populations,” says Carr.

Leda Rosenthal, founder of [Alz You Need](#), a technology discovery platform that connects family caregivers with dementia assistive technology, sees an emerging aging tech market still in the early stages of designing products for various sub-groups. Most of these startups are not even seed-funded.

For the most part, families generally rely on common tech cleverly applied to aging, like meditation apps such as Calm and Headspace, or Facebook support groups.

One aspect Carr sees again and again is adults' desire to maintain independence, noting, "it's still very strong among older adults," especially those of the Greatest Generation who pride themselves on being strong and resilient. They don't necessarily want to depend on their children, but they do need help, and many of them are lonely. [More than a quarter](#) of women aged 65 to 74 lived alone in 2014, and that number jumps to 42% for those aged 75 to 84, and to 56% among women ages 85 and up.



[Photo: ElliQ]

Those kind of statistics inspired Israeli-based startup Intuition Robotics to create [ElliQ](#), a smart robotic companion that engages its user throughout the day. That includes appointment reminders, assisting in video calls to family, suggesting a walk, or just by bringing the outside world in through random facts or funny videos.

Marketed as the "sidekick for happier aging," it looks like a cross between Wall-E and a sleek coffeemaker. It's cute enough to elicit warm feelings, yet its shiny exterior very much connotes artificial intelligence.

ElliQ is personalized, sensing how much its host wants to engage with it and what it prefers as their time progresses. The little guy was designed for older adults who are still active and want to remain so. Studies have shown that once people fall into loneliness, issues such as depression, dementia, and increased mortality rapidly accelerate, says Dor Skuler, CEO of Intuition Robotics. To make it effective, the team understood it had to feature the right kind of personable yet efficient design.

ElliQ will endearingly bob its head up and down when it's excited and apologize by sorrowfully looking down. If a loved one sends a photo, it will curiously look it over. It's meant to feel lifelike, with an expressive nature and intuitive body language.

"She looks at you, lights up, has sound effects and content on the screen, and chooses what to say," says Skuler. "That curated combination—from a timing and movement perspective—makes it feel like it's almost alive."

BALANCING REALITY

The robotics category has long posed existential questions about the role technology should play in our lives. There's been much debate around the concept of the "uncanny valley"—the relationship between how much a product resembles a human and how eerie it seems as a result. This spans multiple categories, such as lifelike dolls, virtual reality, and even computer animation.

Anthropomorphic robots can feel oh so familiar and hence, often inspire revulsion or confusion; other times, an unnatural connection. Ethically, what's the balance between emulating lifelike beings and creating a false dependency?

In the case of robotic companions, this proves especially challenging considering that such products are constructed to work intimately with their users—on a daily basis. Some startups veer towards human-like or cartoon-ish appearances designed to seem overly friendly and cute. [GenieConnect](#) has saucer-like eyes and penguin-like arms that seem more Nickelodeon than elegant. Likewise, Blue Frog Robotics' fully mobile [Buddy the Robot](#) features oversize anime eyes and exaggerated childlike facial expressions.

A Blue Frog Robotics rep says Buddy was made to establish empathy with the user, thereby creating an emotional bond. The company says its research found that to overcome fear and skepticism of a robot in the home, it needs to look friendly. Inspired by the Japanese "Kawaii" culture of cuteness, they designed Buddy with elements taken from lovable characters of science fiction movies, such as *Star Wars*.

Tombot - Affordable Robotic Companion Animals for Seniors |amazing|awesome|j...



Intuition Robotics, however, clearly fashioned ElliQ as a sleek consumer electronics device with a robotic voice. ElliQ has no hands or face—not even eyes. “We don’t want to confuse the older adults in thinking that it’s anything more than it is, or creating the wrong expectations on the intelligence of the system or the fact that it is an electronic,” stresses Skuler. “It’s not a dog, and it’s not a person. So why would we pretend that it is?”

Intuition Robotics tapped Fuseproject founder and designer Yves Béhar to craft a robot that infused the charms and strong persona of the Pixar lamp but didn’t fall into the toy or gadget territory. It had to be elegant and easily blend into someone’s home without screaming technology. It would embody subtle movements, not the exaggerated tones of something overly cutesy.

Basically, they didn’t want to infantilize their audience.

“The opportunity here is to design robots that really serve people that tend to be not served well by technology—and aging is certainly one of those categories,” says Béhar. “We landed on this notion of a beautiful table-top object that reacts when they enter the room but doesn’t intrude or take over the environment.”

Béhar did not want to craft a device that would be an emotional crutch. ElliQ is therefore more reflective of a healthy relationship with something practical, something that you enjoy, he says, “but not something that you are emotionally dependent upon.”



Buddy the Robot [Photo: Blue Frog Robotics]

TO EACH THEIR OWN ROBOT

Independent seniors might not go for creepy realism, but what about those suffering from neurological diseases or severe medical conditions? The overly realistic model might just serve those in desperate need of emotional care, even if it's battery operated.

Tombot's furry Jennie, for example, is designed specifically to meet the needs of seniors with dementia in nursing care. It's estimated there are about 15 million American seniors that either have dementia or have pre-dementia mild cognitive impairment. [Baby Boomers could spark a 75% increase](#) in nursing home care, hitting 2.3 million by 2030. "We're not targeting healthy seniors," says Stevens. "We're building things for people who don't have a choice."

Researchers believe the majority of those diagnosed with dementia can physically and psychologically benefit by forming an emotional attachment, be it to an object or an animal. Pet ownership rates, however, plummet after age 75 because many seniors cannot physically care for a live animal.

Tombot worked with animatronics experts at Jim Henson's Creature Shop to design a realistic robot puppy that would melt senior citizens' hearts. The company's founder says he also surveyed hundreds of senior citizens to better understand their tech preferences. "It came down to one simple thing: realism," says Stevens, noting they nixed cartoon-like appearances. "They prefer a realistic texture and feel. But most importantly, they prefer realistic behaviors."

The fluffy puppy doesn't walk (that would make him easy to trip over), but he does contain multiple sensors for an autonomous and interactive petting experience. Unlike competitor products, which are more or less mechanical toys, Tombot is designed to emulate the actual anatomy and movement capability of live animals.

He understands voice commands and will orient toward sound. Tombot can also feel where and how it's being touched, sensing the difference between a vigorous pet and being held. The behaviors are randomized, which adds to its sense of discovery. (It's software is updatable so it will continuously expand and improve behaviors.)

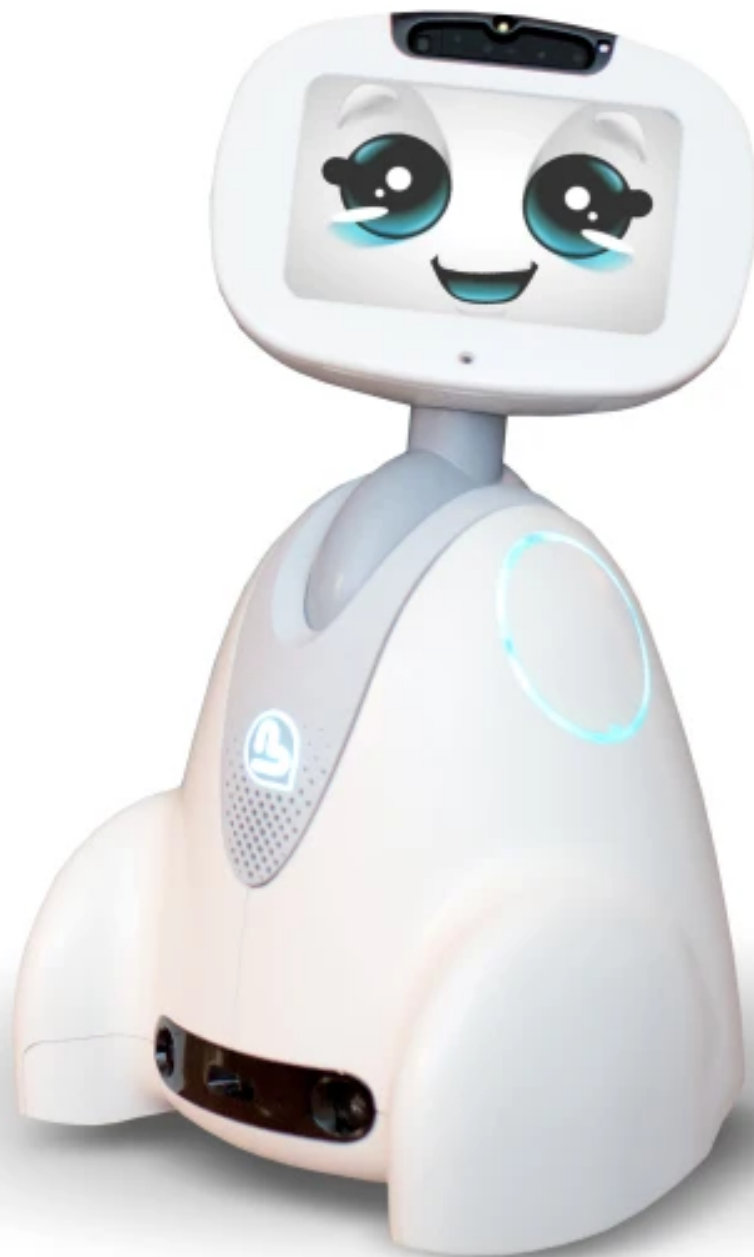
"The dog is choosing what to do at a given time, as to not resort to the same behaviors over and over again," says Stevens.

Tombot's early findings showed that seniors actually prefer the robots to live animals. That's because real dogs choose when to interact with humans, whereas these residents could choose when to interact with a robot. Already, says Stevens, numerous assisted-living facilities, senior day care centers, and an unnamed hospital chain intend to purchase their product for their members. Tombot is available for pre-order at \$449 and will ship in March 2020.

"If you group all the tech into one category and say this is for seniors, you'll understand why so many products never get off the ground," says Stevens. "We're focused very specifically on the problem of people with issues that can't care for a live animal."



[Photo: ElliQ]



[Photo: Blue Frog Robotics]

A “CRUEL” REPLACEMENT?

Is it ethical to use robots to supplement, or even replace, human caretakers? Dr Lee Kai-Fu, an artificial intelligence expert and former head of Google China, has publicly lambasted the use of AI to care for older populations, specifically in regard to emotional capabilities. Children should be subject to elderly care, he insists, with professional caretakers the next best thing.

“Elderly people really want to connect with other people and I think giving them primitive, fake, inanimate and non-emotional robots to interact with is a cruel thing that we should not do as human being,” [he recently stated in an interview](#).

There are also those who ponder the effects of robots on the elderly, especially in the absence of any long-term studies. Can we put our faith in such new technologies? What about privacy concerns? How will robots impact users in the long run?

Intuition Robotics is currently embarking on a clinical research study regarding the relationship between human and social robots. The startup partnered with the Centre for Aging + Brain Health Innovation to examine how robotic companions decrease the feeling of loneliness and isolation in seniors.

Based on what he’s seen with his hundreds of test subjects, Skuler remains optimistic. He recalls ElliQ owners talking about the product not simply as a device but almost as a new entity in their lives. “Some people use the word presence, some say entity, companion, or sidekick,” he says, musing, “it’s part device and part alive.”

Still, it’s too early to say how this nascent industry will shake out. Will even the best designed robots be adequate substitutes for human care? There’s plenty riding on that answer. Japan, a leader in the robotic service sector, expects its domestic industry alone [to grow to nearly \\$4 billion annually by 2035](#).

Carr believes that despite some of these products’ predicted issues, they will ultimately find a home with consumers who feel they have no other choice. Humans might be better caretakers, but as they become more scarce, she says, “technology might be the next best thing.”

ABOUT THE AUTHOR

Rina Raphael is a writer who covers technology, health, and wellness for Fast Company. Sign up for her newsletter on the wellness economy here: <https://welltodo.substack.com/> [More](#)

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How to get the ultimate home office, according to 4 CEOs who work remotely

The CEOs of Basecamp, Flexjobs, InVision, and Dribbble share the ultimate work-life hacks. Tip No. 1: Make sure there's a door—that locks.



Basecamp CEO Jason Fried's home office. [Photo: Christopher Barrett]



BY KATHARINE SCHWAB

6 MINUTE READ

If you commute to an office every day, working from home is the ultimate perk. But some companies have transitioned completely away from headquarters and have [workforces that are entirely remote](#). Some workplace experts are even calling remote work [the “new normal.”](#)

At a completely remote company, everyone in the organization—even the CEO—has to carve out a space in their home in which to work (or find a lenient coffee shop). *Fast Company* spoke to four CEOs who head up these remote companies—Jason Fried of Basecamp, Clark Valberg of InVision, Sara

Sutton of FlexJobs, and Zack Onisko of Dribbble—about how they designed their personal headquarters for one. Spoiler alert: There are [no pajamas involved](#).



FlexJobs CEO Sara Sutton's home office. [Photo: courtesy Sara Sutton]

GET YOURSELF A DOOR (OR TWO)

Having some way to separate your home life from your work life is a key element of any home office, according to every CEO *Fast Company* spoke with.

Jason Fried, the CEO and cofounder of the project management company Basecamp, designed an entirely separate floor in his house for his and his wife's home offices. As a result, he has created a mini commute for himself when it's time to go to work: He heads up the stairs to his office, and closes the door. But there's also another door to the stairwell, giving him an extra partition from the rest of the house. "I wanted to create a mental gap or break between home and work as best I could," he says.

Same goes for Clark Valberg, CEO and cofounder of the digital design platform InVision. While he doesn't have two doors, he emphasizes another important feature that enforces the distinction between home and office: "I have a door that locks," he says. "I think it's important when you work from home you get in the habit of locking the door every time you walk in [to your office]."

The idea is to prevent distractions, like Valberg's two children, though he takes time during the day to hang out with both of them. He sees his son when he gets home from school, but he can see his 2-year-old daughter anytime. "It's great to be able to pop over and see her—much better than an office cat," Valberg says. "Less hairy, more diaper changes."

CEOs aren't your average worker—after all, not everyone can afford their own custom-designed house, let alone an extra room that could be a dedicated office space. For Sara Sutton, the CEO and founder of the remote work recruitment company FlexJobs, there are other ways to create that distance. "If you can't have a door, it's a screen—some psychological separation from where you work and where you sleep," she says.

Sutton herself has a dedicated office, one she created by putting up a wall in her house's guest bedroom. Her children's desks are in there as well. "I want them to have the same sense of differentiation [from when they're] in front of the computer and when they're not," she says.

InVision CEO Clark Valberg's home office. [Photo: courtesy Clark Valberg]

START WITH A CLEAN SLATE

So you've got a door (or screen): How do you start thinking about designing your workspace?

Sutton recommends starting with a bare, clean room—no clutter. Then, see how it works for you before you start adding furniture, technology, and decor that you think will help you create your ultimate working environment.

"If I were starting an office from scratch, I'd really be clear on what makes you happy," Sutton says. "What elements are most important to you?" For her, dual monitors and a big desk where she can spread out are a must. She also has a scanner and file cabinet, though she says that it's just as important for her to have a window and a space heater as it is to have a place to store her papers. Some things are necessary for basic comfort.

Dribbble CEO Zack Onisko's home office. [Photo: courtesy Zack Onisko]

SURROUND YOURSELF WITH OBJECTS AND IMAGES THAT INSPIRE YOU

Zack Onisko, CEO of design portfolio company Dribbble, describes his office as a "cool little work cave." He has covered the wall behind his desk with artwork from artists who have their portfolios on Dribbble, as well as illustrations from other people in the design community. His office also doubles as a music studio: There are guitars and a home audio recording set up. His office becomes a place for his passions—work, design, and music.

Sutton also advises adding objects and images to your home office to help nurture a positive mindset. She has a photograph of an ocean over her desk, which she says brings her peace and calm. "Things like that which help you get in a non-cluttered headspace to work are very helpful personally," she says. Whether it's an image of the ocean or the Sex Pistols, go with whatever inspires you.

But be intentional about which images help clear your mind and which might distract you. Sutton says she does have pictures of her children in her office, but they're mostly off to the side, not in her direct line of sight—which helps her maintain some of that separation between home and work. “There’s already an inherent challenge when you work from home that you’re blurring lines,” Sutton says. “I find that the more you can create spaces where those lines aren’t continually blurred is helpful.”

That idea extends to the objects in her office, which she carefully curates. “I have a little clear quartz stone, and it’s something that symbolizes a good time and good people and hard work,” Sutton says. “It’s something I look at all the time. I have these little touchstones pieces around that ground me in what I’m doing. They can be small. They don’t have to cost a lot. But they bring you to the [mental] place you want to be.”

InVision CEO Clark Valberg’s big green chair. [Photo: courtesy Clark Valberg]

FIND A SECOND CHAIR

For any home office, of course you’re going to want an ergonomic chair for your desk. But for Valberg of InVision, you need more than one chair in your home office. He has a hulking green lounge chair on the other side of the room from his desk because sitting in it helps him slightly shift his perspective on the room—and on his work. “I use this impromptu when I find myself creatively stuck,” he says. “It’s a little bit magical. Just get a different chair and put it in the room.”

This can’t just be any chair, though: It has to be a very different feeling chair from your desk chair, with a different height and posture. Bonus points if it’s a wacky color. “This is my shortest commute,” Valberg says. “I will very often take a call from [the chair] to get away from the screen and to change my view of the room.” He also will sometimes answer emails on his phone while sitting in the chair, sketch out ideas in his notebook, read, or watch videos on his VR headset.

While this isn’t necessary for everyone, Valberg also has a third chair in his office, a simple black chair that symbolizes his customer: “[It] reminds me that even if no one else is in the room, the customer is always here,” he says.

ABOUT THE AUTHOR

Katharine Schwab is an associate editor based in New York who covers technology, design, and culture. Email her at kschwab@fastcompany.com and sign up for her newsletter here: <https://tinyletter.com/schwabability> [More](#)

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