

Robots as companions: are we ready?

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Some people on Earth seem to think so. In fact, they believe in the concept so much, they are actually building the world's first personal robot that can read and respond to human emotions. Collaboration between French robotics firm, Aldebaran and Softbank mobile (1) from Japan, you may already know one of Aldebaran's existing robots, Nao (2) (*Figure 1*). The new robot is called Pepper, and is due to launch in Japan in February 2015 (3), and is priced at 198,000 Yen. Using today's exchange rates that are approximately \$1,681 and £1,074, although only the Japanese launch has been confirmed for now. Pepper may be sold in the USA through Sprint stores at some point (4). The notion of a robot in your home that can interact with you, and even tell you a joke if you're feeling sad, which attracted my curiosity. So much so, that in September 2014, I hopped on a train from London to Paris.

Why Paris? Well, the world's first home robot store opened in Paris (5) this summer, called Aldebaran Atelier, and they had Pepper in the store (*Figure 2*). You can't buy any of the robots in the store just yet, it's more a place to come and learn about these robots.

So what's Pepper like? You have to bear in mind that the version I interacted with in Paris is not the final version, so the features I saw are not fully developed, especially the aspects of recognising who you are, and getting to know you and your needs. The 3-min video (*Figure 3*) shows some of the interaction I had. For now, Pepper understands English, French and Japanese.

There are bit more about how Pepper works. In the final version, Pepper will be able to understand 5 basic emotional expressions of the face: smiling, frowning, surprise, anger and sadness. Pepper will also read the tone of your voice, the verbiage used, as well as nonverbal communication such as tilting your head. So for example, if you're feeling sad, Pepper may suggest you go out. If you're feeling happy,



Figure 1 One of Aldebara's existing robots—Nao.

Pepper may sing a song and do a dance for you (more on that later). According to a Mashable article (6), "*Pepper has an 'emotional engine' and cloud based artificial intelligence*". The article also states, "*The cloud AI will allow Pepper to share learnings with cloud-based algorithms and pull down additional learning, so that its emotional intuition and response can continually improve. It's either a technological breakthrough or the most terrifying robot advancement I've ever heard of.*"

Some facts and figures for you:

- (I) Four feet tall, and weighs 61 lbs/28 kg;
- (II) Twelve hours battery life—and automatically returns to charging station when battery is low;
- (III) 3D camera which senses humans and their movements up to 3 m away.

In the press kit I was given at the store, it's stated that "*Pepper's number one intention is about being kind and friendly.*"

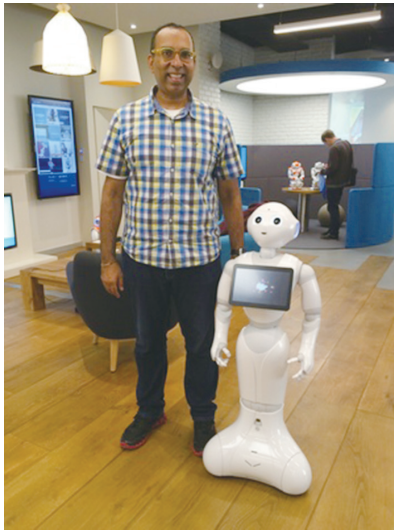


Figure 2 The author and Pepper in Paris.



Figure 3 The author's interaction with Pepper. Available online: https://youtu.be/f8_2h1Guoag

He has been engineered to meet not functional but emotional needs."

It's not just speech and movement that Pepper responds to, it's also touch. There are sensors on the upper part of his head, upper part of his hands and on the tablet attached to his chest. Pepper may be talking to you, and if you place your hand on his head, the way that you would with a child, Pepper will go quiet. Although, when I tried it, Pepper responded by saying something about sensing someone was scratching his head!

The creators anticipate Pepper being used to care for the elderly and for babysitting (7). What are your thoughts? Do you envisage leaving your elderly parent or young child with Pepper for company whilst you do some chores or dash

to the supermarket? I told Shirley Ayres (8), Co-Founder of the Connected Care Network, about Pepper. Her response was: "I'd prefer a robot companion to 15 min of care by a worker on minimum wage struggling to provide quality care on a zero hour contract."

Given aging populations, and the desire for many to grow old in their own home, rather than an institution, are household companion robots the answer to this challenge? As technology such as Pepper evolves, will a robot at home be the solution to increasingly lonely societies? Will we really prefer the company of a household robot *vs.* another human being? Will we end up treating the purchase of Pepper the same way we treat the purchase of an Ipad? Will your children buy you a Pepper so they don't have to visit you as often as you'd like? The CEO of Aldebaran, Bruno Maisonnier, believes they will sell millions of these robots (9). Apparently, they'll be able to make a profit from the sales of robot related software and content. Apps for robots?

Pepper does have all sorts of sensors so it can understand humans as well as understand the environment it's operating within. I understand it will collect data, but it's not clear to me, at this stage, exactly what would be collected or shared. Just because Pepper seems kind and friendly, doesn't mean we should not consider the risks and benefits associated with any data it collects on us, our behaviours and intentions. There could be immense benefits from a robot that can 24 h a day reminds an older person when to take their medications, and potentially collect data on when doses are being skipped and why.

An Institute of Medicine panel has just recommended (10) that "Physicians should collect more information about patients' behaviour and social environment in their electronic health records." Some of the information the panel recommends collecting include "whether they are experiencing depression; their social connections and sense of social isolation." Is technology such as Pepper the most effective route to collecting that data? Do we want a world where our household robot sends data to our doctor on how often we feel sad and lonely? Perhaps for those of us too afraid to reach out for help and support, that's a good thing?

My brief interaction in Paris with Pepper was fun and enjoyable, a glimpse into a possible future. With its childlike gestures and ability to monitor and respond to our emotions, could we as humans one day form emotional attachments to household robots? Here is the video of Pepper wanting to play some music for me in the Paris store (Figure 4).

One does wonder how the introduction of these new



Figure 4 Pepper the robot dances in the Alderbaran Atelier Paris store. Available online: <https://youtu.be/2HtYL362ZcU>



Figure 5 How pepper might work in selling to consumers in Nestlé's stores. Available online: <https://youtu.be/FGbc-G1ITaU>

robots might impact jobs. What does technology such as Pepper mean for human careers? A recent report from Deloitte forecasts that 30% of jobs in London are at high risk from automation (11) over the next 20 years. Its low paid, low skill jobs that are most at risk. Microsoft is trying out a different robot called K5 from Knightscope (12) as security guards in their Silicon Valley campus. In Japan, Pepper has been used by Softbank (5) to conduct market research with customers in a Tokyo store. Nestlé is planning to use Pepper to sell coffee machines (13) in 1,000 of its stores across Japan by the end of 2015. Here is the video showing how Pepper might work in selling to consumers in Nestlé's stores (Figure 5).

Now, some of us may dismiss this robot technology as crude and clumsy, with little or no potential to make a significant impact. I personally think it's amazing that we've reached this point, and like any technology, it won't stand still. Over time, it will improve and become cheaper. We are at a turning point, whether we like it or not. Does Pepper signify the dawn of a new industry, or will these household

robots be rejected by consumers? How are household robots treated by the law? Do we need to examine how our societies function rather than build technology such as Pepper? Are we becoming increasingly disconnected from ourselves that we need Pepper in our homes to connect with ourselves as humans? Does the prospect of having a robot like Pepper in your own home with your family, excite you or frighten you?

Given the intense pressure to reduce costs in health and social care, it would be foolish to dismiss Pepper completely. So in the future, will we also see companion robots like Pepper stationed in hospitals and doctor's offices too? Can personal robots that connect with our emotions change how we "deliver" and "receive" care?

Link to original post: <http://maneeshjuneja.com/blog/2014/11/23/robots-as-companions>

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Footnote

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