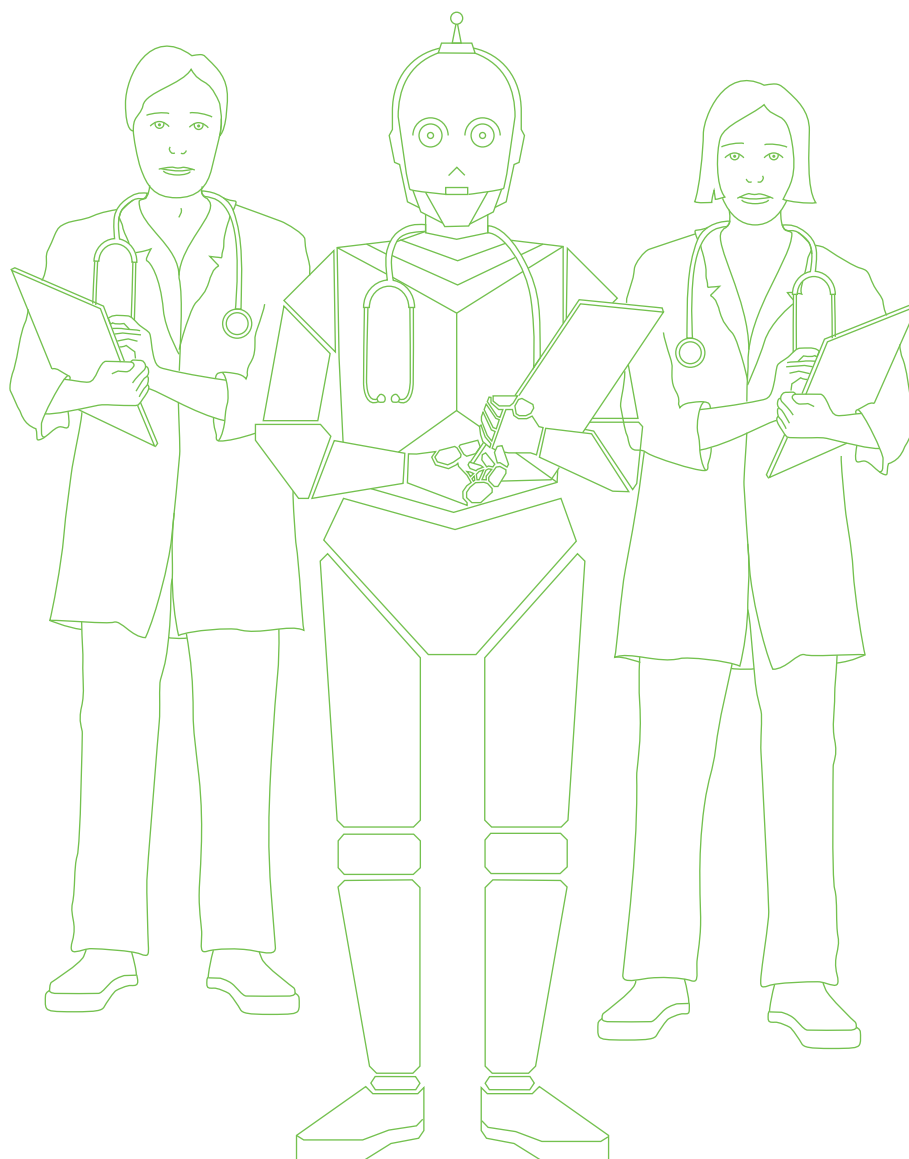


“Social robots could work as part of teams”

Interview with **Bart de Witte**
Hartmut Schulze

By Valerie Zaslowski, Think Tank W.I.R.E.



Social robots are gaining a foothold in medicine, care for the elderly and in people's relationships. In this interview Bart de Witte, expert in digital transformation in healthcare, and Hartmut Schulze, occupational psychologist and head of the FHNW Robo Lab, explain how this technology will be increasingly used in nursing care and care for the elderly. While Mr. de Witte sees robots as a challenge to social solidarity, Mr. Schulze describes ways how the use of social robots could create stronger cohesion between people.

What's the difference between traditional and social robots?

Bart de Witte: Traditional robots have been used to automate human tasks, for example in the automotive and catering industries. But they've always looked more like machines than humans. Since the dawn of science fiction or thereabouts (1907)¹, there has been a movement that strives to replicate humans technologically. These robots, known as humanoids, look and move like humans and can even laugh. But now you have social robots, which aren't necessarily humanoids. A social robot could also look like a teddy bear or a seal. The outer form isn't important, as long as it's equipped with artificial intelligence allowing it to respond empathetically to people.

Hartmut Schulze: Scientists differentiate between two groups of social robots: socially interactive robots and socially assistive robots. Socially interactive robots are designed to entertain people by means of verbal communication, gestures, facial expressions, dancing and singing, while socially assistive robots take the form of robot assistants or robot companions designed to support people in their work or everyday life. To do this, they must interact and communicate with humans. They need to be able to recognise emotions and simulate appropriate empathetic interactions.

Robots with empathy?

De Witte: The question is: What is empathy? I distinguish between emotional and cognitive empathy. Emotional empathy means, for example, that you can feel another person's pain. To do this requires consciousness, which is something social robots haven't been endowed with so far. Artificial intelligence (AI) isn't yet able to build consciousness. In fact, it's a long way from being able to do so. But there's also such a thing as cognitive empathy. This functions via a kind of pattern recognition – and AI is quite capable of that. It involves reading certain patterns and generating corresponding reactions. What I'm talking about here is artificial empathy.

Schulze: Although social robots have basic social functions and can recognise and express emotions, they lack the quality of experience. For example, when a social robot says: "I'm happy to see you today", even if it underlines this sentence with gestures and simulates happiness, it lacks what is known as qualia – the robot doesn't know what it feels like to be happy.

Can social robots use exact pattern recognition to respond more empathically than humans, at least on the cognitive level?

De Witte: Social robots could theoretically read more from facial expressions than humans can. They're usually equipped with sensors or algorithms, so – if they were ever programmed to do so – they could analyse your blood pressure or take your pulse while having a conversation. They could also analyse your voice and match it to a mental state. By way of another example, they could analyse your breath to measure the level of proteins in your body

1: Tik-Tok (Oz): [https://en.wikipedia.org/wiki/Tik-Tok_\(Oz\)](https://en.wikipedia.org/wiki/Tik-Tok_(Oz))

and link this with possible clinical pictures or emotional states. This means we would be giving social robots technical possibilities that exceed our human capabilities. We would enable them to understand and respond to us incredibly well. Social robots would therefore be able to adjust their behaviour to our wishes. This could be dangerous, because robots would then be in a position to manipulate people.

Schulze: I believe that social robots will at least be able to simulate consistent empathic behaviour. Unlike us humans, they don't make their form of empathy dependent on liking someone. With the appropriate programming, they will always be able to respond with the same level of empathy no matter who they're interacting with.

In what kinds of industries could robots like these be used?

Schulze: Social robots are only now making the transition from the lab to practice, which is why – apart from a few exceptions such as Paro the robotic seal – we're currently only able to observe prototypes in action. Our experience shows that tourism will be one key area of application. For example, robots can help out at hotel reception desks or in shopping malls, where they can provide information and draw in customers. The second economically and socioculturally relevant area is healthcare. Here we're currently trying to find tasks that social robots can perform.

De Witte: Solutions are being sought out in nursing and elderly care to maintain the current system, due to the well known lack of resources and rising costs. There's also a lot of discussion about how social robots can be used in the sex industry. Incidentally, all kinds of robots are already being used in the hospitality industry in Japan and China, where you may be greeted by robots at the reception, have your room cleaned by robots, and eat food that robots have helped to prepare. So, any highly repetitive jobs can be automated.

But nursing care isn't a highly repetitive job. It's about contact with people.

De Witte: That's true of nursing, yes. But it's a big employer and, as in any area of the economy, people are trying to automate to cut costs. I think that developments are going in the wrong direction. Today, nurses spend 70% of their time with bureaucracy.² Only 30% of their work involves personal interaction. It would therefore make more sense to start with the 70% and develop an automated system of bureaucracy instead of talking about how to replace human-to-human activities with social robots.

Schulze: In the media there's a lot of talk about the replacement paradigm, the idea that social robots will take over valuable human activities and interact fully autonomously with patients. I don't think this scenario will be realised with the next generation of robots. We're more likely to see "teaming" between robots and employees or patients in science. Social robots could perform tasks as part of a team, become team members. They could be incorporated into a care concept, taking on the role of robot assistants, for example. That's where I think things should be heading.

2: How much time do nurses have for patients? a longitudinal study quantifying hospital nurses' patterns of task time distribution and interactions with health professionals: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3238335/>

Could social robots help cut healthcare costs?

De Witte: At the moment, social robots are still expensive, costing between 20,000 and 50,000 US dollars apiece.³ But the technology's likely to get cheaper and cheaper. If at some point it costs less than a care giver's annual salary to develop a robot, it may be possible to reduce healthcare costs. But, as I said, it's more important to ensure that care givers don't have to spend 70% of their time dealing with bureaucracy.

Schulze: First and foremost, we have to ensure that healthcare institutions can fulfil their mission of patient care and healing, regardless of the costs. The coronavirus shows just how quickly certain services can no longer be provided at the same level of quality. Social robots could help overcome these types of challenges. And don't forget that it's the programming of the robots that's particularly expensive. Without programming, they can do next to nothing.

Our healthcare system is built on solidarity, with young people taking care of the elderly, and the healthy taking care of the sick. What would it mean for our concept of solidarity if nursing care was provided primarily by social robots?

Schulze: As long as support and care isn't provided entirely by social robots, the idea of solidarity will not be undermined. However, robots have to be incorporated into a social framework. It's important that there are still human relationships.

De Witte: Essentially, social robots are an economic product that follow the market logic of supply and demand. Solidarity involves interaction between people, a sharing of costs. The extent to which the concept of solidarity is undermined by the use of social robots therefore depends on the business model of the company using the social robots. Currently, business models involving artificial intelligence are mainly focused on collecting as much data as possible in order to generate knowledge about this data. Facebook is one such example. It's no longer about services alone. We've become part of the product. If this scenario were to occur in healthcare it would no longer have anything to do with solidarity, because we would lose our dignity.

What happens to the data collected during interaction with a robot?

De Witte: It depends on how much and what data social robots collect, how much they're allowed to see and give away. Companies usually have an interest in collecting as much data as possible to identify new correlations and recognise patterns.

Schulze: At the moment, many social robots are still walking computers with no regular interface to the internet. This means data is collected locally, not centrally. It's therefore up to the companies using social robots to define clear rules on how to deal with the locally stored data. However, this topic is becoming more controversial, because with the internet and the cloud making everything more centralised, the risk of data misuse and manipulation is increasing.

Could social robots also strengthen cohesion between people?

De Witte: Have you seen the film HER that was released in 2013? A human falls in love with a robot. I think we could think about this scenario the other way around: Instead of falling in love with technology, we could use it to strengthen human interactions. For example, robots could help reduce the divorce rate, currently around 40% in Switzerland, and technology

3: <https://www.cnn.com/2019/10/31/human-like-robots-have-entered-the-workplace-and-may-take-your-job.html>

could help make us more human again by giving us more time for human interaction. I would therefore answer this question with a yes. At least that's an image of the future that I'm trying to make happen.⁴

How can robots help save marriages and strengthen human interaction?

De Witte: Algorithms could first be used to analyse how “healthy” a marriage is, enabling methods from couple therapy to be applied earlier if necessary. Chatbots applying methods from cognitive behavioural therapy are already used for patients suffering from depression. Studies show that symptoms can be reduced by more than 25% two weeks after patients start using these kinds of chatbots.⁵

So, social robots could be used to make people more empathetic and strengthen social solidarity?

De Witte: Yes, in some ways this is already happening. For example, social robots are already being used with autistic people who are unable to recognise human emotions.⁶ They can help them learn how to recognise emotional states. Studies show that children are better able to classify emotions after just a few hours, encouraging more empathetic behaviour and maybe helping them feel and show greater solidarity with other people.

Schulze: I also see possibilities for use in psychotherapy and sex therapy. For example, people could use social and sex robots to try out ways of interacting. This could be used as part of therapy to help them, for example, gain social skills and build confidence. There's also potential for helping reduce loneliness, particularly among elderly people. Social robots could help them be more active in resuming social relations by calling relatives or initiating contact with other people. Encouraging older people to interact could help them communicate more, a vital part of showing empathy and solidarity.

Can social robots also have a negative impact on interpersonal relationships?

Schulze: It remains to be seen whether interacting with social robots will lead us to adopt an asynchronous model of relationships with humans as well. This kind of spill-over effect could be problematic. Basically, what I get from a social robot exceeds what I have to invest emotionally. So it doesn't matter how I behave, because I get the robot's affection anyway as this is how it's programmed. So far these discussions are very hypothetical, because we've not yet implemented such relationships. From a theoretical point of view, however, in a positive scenario it would also be possible for humans to be fully aware of the asynchronous quality of the relationship and to differentiate artificial relationships with a social robot from a real relationship with other humans.

Does this mean that using social robots could result in people unlearning their ability to empathise?

De Witte: If we start to replace human interaction with human-robot interaction, we have to ask ourselves what kind of society that leaves us with. Once we add computer-brain interfaces to the mix, we've finally reached the Matrix. Ultimately, we have to decide how synthesized we want our society to be. Either we surrender completely to this synthetic world – or we decide that technology should remain under human influence and continue to support us.

4: Do we really want to fall in love with a virtual Scarlett Johansson, or HER?: <https://medium.com/the-healthcare-nerd-the-digital-strategist/do-we-really-want-to-fall-in-love-with-a-virtual-scarlett-johansson-or-her-35de06e0c715>

5: Delivering Cognitive Behavior Therapy to Young Adults With Symptoms of Depression and Anxiety Using a Fully Automated Conversational Agent (Woebot): A Randomized Controlled Trial: <https://mental.jmir.org/2017/2/e19/>

6: Roboter nimmt Angst vor Menschen: <https://www.spiegel.de/wissenschaft/mensch/autismus-therapie-roboter-nimmt-angst-vor-menschen-a-569595.html>

Schulze: We have to ask ourselves early on at what point the relationship with social robots turns into a dependency. Theoretically, this could lead to an addiction, with people preferring to spend time with robots rather than with real people. That would be a critical situation that should be identified in good time.

Robots are becoming increasingly human and acting more and more autonomously. Their “rights” are often discussed by ethicists. At what point must artificial beings be included in the debate on solidarity?

De Witte: As long as robots have no consciousness, they have no rights, which means they don't need to be included in any debates on solidarity. I think it would be dangerous to give rights to social robots, because then we would no longer be able to question certain things – such as their ability to manipulate – because they would be protected as beings. However, should social robots one day nevertheless be granted rights, it will be important for them to be kept autonomous so that the data isn't centralised.

Schulze: The American sociologist Sherry Turkle said in this context that robots are alive enough for us to humanise them and make them our partners, but at the same time machine enough to dehumanise them, to separate us from them again. In the future, we'll be faced with the challenge of finding the right balance. Choosing the right level of humanisation or dehumanisation could be a new skill in the age of social robots.

Finally, where does Switzerland stand with regard to research in robotics?

De Witte: From a research perspective, Switzerland is very well placed to be a leader in the field of robotics, and is certainly one of the top 20 locations in this field. Switzerland is also in a good position in terms of production. I think Switzerland can play its Swissness card when it comes to trust in companies. The Swiss sense of duty can be a hallmark of quality.

Schulze: And let's not forget the design perspective from the point of view of humanist ethics. I think Switzerland is in a good position here, too. But maybe I'm overestimating this because we ourselves want our FHNW Robo Lab to play a part in all this.



Hartmut Schulze studied occupational and organisational psychology at the University of Hamburg. After completing his doctorate, Schulze joined DaimlerChrysler's research and development team in 1999. Here he headed the Psychology in Engineering team at the IT for Engineering laboratory. He has worked as a professor at the FHNW School of Applied Psychology since 2006 and has been Head of the Institute for Research and Development of Collaborative Processes since 2011. His research and teaching focuses on the analysis, design and evaluation of concepts and solutions for work and office spaces, mobile-flexible work and human-robot interaction.



Bart de Witte is a leading expert in digital transformation in healthcare. He worked at IBM for eight years – advancing to the position of Director Digital Health for Germany, Austria and Switzerland – and before that worked at SAP Switzerland for nine years, holding various positions including Business Development Director. In March 2019, he founded the HIPPO AI Foundation in Berlin, the first global NGO for open source-based artificial intelligence in medicine. In April he co-founded the Digital Health Academy in Berlin with Professor David Matusiewicz. He is also part of the founding faculty of the European Institute of Exponential Technologies and Desirable Futures, futur.io.