Social robots [provide therapy](http://www.technologyreview.com/view/521746/how-social-robotics-is-revolutionising-therapy-for-autistic-children/) (or co-therapy, in combination with the efforts of a human expert) and potentially even help teach autistic children new skills.

* Studies across different parts of the world are emphasizing on the use of physical therapists for treating autism and controlling the symptoms. Research has revealed that kids showed remarkable improvement in their conversational skill while interacting with robots, as compared to sessions with human therapists. Parents also reported that these children, exposed to robot therapy, showed greater result and improvement at home.
* A **social robot** is an [autonomous robot](https://en.wikipedia.org/wiki/Autonomous_robot) that interacts and communicates with humans or other autonomous physical agents by following social behaviors and rules attached to its role. This definition suggests that a social [robot](https://en.wikipedia.org/wiki/Robot) must have a physical embodiment (screen characters would be excluded).
* The robot could, for example, exhibit **competitive** behavior within the framework of a **game**. The robot could also interact with a **minimum or no communication**. It could, for example, hand tools to an **astronaut working on a space station**. However, it is likely that some communication will be necessary at some point.
* **Autism** is a lifelong, developmental disability that affects how a person communicates with and relates to other people, and how they experience the world around them.

**(nonverbal autism** -- Some people have the ability to speak, but [lack the ability to use language](https://www.verywell.com/speech-vs-communication-260566) in a meaningful way. Others can't use spoken language, but are able to communicate with written or typed language, American sign language, [picture cards](https://www.verywell.com/autism-and-the-picture-exchange-communication-system-260506), or [digital communication devices](https://www.verywell.com/what-is-nonverbal-autism-260032).)

Is a **spectrum** condition. Some autistic people also **have learning disabilities** and other conditions.

* Autistic people may also experience over- or under-sensitivity to **sounds**, **touch**, **tastes**, **smells**, **light** or **colors**.
* *People with autism typically have trouble* ***communicating, looking people in the eye, and can get upset by loud noises or bright lights.***
* *In particular, many autistic people like* ***order and predictability****.*
* *We think of it only as the disability of communicating or understanding other people’s emotions, but it can be much worse than that.*
* *Talk about how they have problems walking through a shopping center or at McDonalds Chain Restaurant (break down crying).*

**Numbers**

By current definition, the onset of autism is prior to age 3 years.

* When autism was first characterized by **Leo Kanner** in 1943, the prevalence was estimated at 1 in every 2,000 children.
* Today, one out of every 68 children is affected with autism or a related disorder.
* Thus, it is more prevalent than breast cancer or childhood diabetes.
* The recurrence rate for having a second child with autism if one already exists within a family is thought to be 15-20%.
* It is 4 times more common in boys than girl
* 25% of people diagnosed with it have nonverbal autism

*„The robots have no emotion, so autistic children find them less threatening than their teachers and easier to engage with.“ ~ Ian Lowe, headteacher of the Topcliffe Primary School in Castle Vale, Birmingham*

**Goals**

The main goal of using this technology is to promote overall social behavior.

Most *parents who have got their autistic children treated with sessions of robot therapy have failed to understand how and why this improvement occurs*. Although it is true that most patients have shown *remarkable improvement* by the sixth sessions,

*When a child interacts with the robot, it is almost the same as interacting with a normal person to develop social behavior.*

* *One of the major purposes of a robot in autism is to help teach children with autism appropriate social responses and create situations in which children can practice these skills. The use of a robot in therapy may be able to prime social responses that otherwise would not be possible.*
* *A second purpose of the robot is to help the children apply the social responses learned from the robot to interactions with the therapist, and, ultimately, with family and peers outside the clinic.*

***Romibo***

* At the Duck’s Nest preschool in Oakland, Calif., a fluffy blue robot asks a group of toddlers, “I want to be your friend. Will you please be my friend?”
* *Robotics experts are testing this low-cost and affable robot, called [Romibo](http://www.romibo.org/)*, at schools across the country. According to its creator, *Aubrey Shick*, special-needs children can benefit most from social robots like Romibo — particularly those with autism.
* *“The robot is safe. The robot’s facial features don’t change,” says Laura McGuire, the mother of Liam, an autistic child.*
* *“There’s not so much to figure out with talking to a robot, where there was a lot to figure out in talking to a human being.”*

**Kelly**

*In 2013, interest in social robotics grew when the*[*University of Notre Dame published results*](http://news.nd.edu/news/15169/) *from a study of 19 children with autism, which may be the largest trial to date for this technology. The researchers purchased a $14,000 talking robot, nicknamed Kelly, to coach autistic children to make eye contact or take turns talking. Kelly is a Nao “humanoid” robot, developed by French parent company*[*Aldebaran*](http://www.aldebaran-robotics.com/en/)*in collaboration with eight universities and robotics companies in the U.K., France, Switzerland, Greece, and Denmark.*

The results were promising: Social robots do seem to help autistic children.

**Nao**

*Today, NAO is the leading humanoid robot being used in research and education worldwide.*

Robotics is the fastest growing and most advanced technology used in education and research. The NAO humanoid robot is the ideal platform for teaching Science, Technology, Engineering and Math (STEM) concepts at all levels.

The advanced software package includes a full SDK and API in Java, C++, C# (.Net), Matlab, and Python. Every robot comes standard with ***Choregraphe***, *an award winning software that makes it easy to program the robot using a drag and drop interface which simplifies the programming for new and advanced users alike.* The software package includes an advanced simulation software based on *Webots*.

*NAO was programmed with a series of verbal prompts and gestures that imitate those used by human therapists. The robot adapted its behavior to each child automatically depending on how he or she responded.*

The researchers tested the effectiveness of the robot-based system in joint attention training with a dozen 2-5-year-old children, six with ASD and six without. They compared how the children performed in short human-led and robot-led sessions and found that **all of the children spent more time looking at the robot than they spent looking at the human therapist.**

**Bubblebot**

**could provide companionship to lonely seniors, teach coping skills to adolescents with depression or even help someone quit smoking or lose weight.**

*Maja Mataric, PhD, a robotics researcher at the University of Southern California describes one child with autism who engaged with the bubblebot. The boy tried to tell the robot what to do, but became frustrated when the robot was unable to follow his instructions. "Then he said, ‘This is how my teacher feels when I don't do what the teacher says,'" she recalls. "This was an incredible narrative of empathy that the therapist was just jumping up and down about."*

**Leka**

*Called* [***Leka***](http://www.leka.io/)*, the motion-sensitive bot lets children play learning games by providing sensory stimulation through movement, lights, vibration and sound.*

*Its makers have likened it to a 'guide dog' for children with the condition, helping them to navigate the challenges of learning and social interaction.*

The model revolves around the concept of ***gamification***, where *typical elements of gaming, such as point scoring and competition, are applied to learning to make it more* ***accessible****.*

A selection of single and multiplayer games will be available to users to help develop motor and intellectual skills.

**Milo**

*Milo can sense when a child begins to get frustrated or agitated and can react accordingly.*

**"We found that especially with the fluent children, they were engaged with Milo 87 percent of the time,” Rollins said. “We also looked at how much they were engaged with the therapist when she tried to talk to them. It was about 3% ."**

*The robot speaks 20% slower than an average human and has a broad, but still limited, range of facial expressions. He is less likely to display emotions that get in the way of learning.*

“If you don't get it, he can repeat it over and over and over and over and over and never get frustrated,” Rollins said.

**Can these robots replace human therapists?**

*Not only can robot-enhanced therapy ease the workload of human therapists, they can also lower the cost of treatment and help patients who have greater difficulty dealing with humans in social settings.   Robots can be used in a variety of different ways while their value in providing direct feedback to patients and interacting with them on a regular basis helps improve the overall therapy process.*

Though it can never completely eliminate the need for human therapists, *robot-enhanced therapy is already yielding results, especially with difficult populations such as dementia patients and individuals with autism.*

*So, is there a robot therapist in your future?  What do you think?*

*Questions remain about the type of robot that will have long-term success with an autistic child. It’s still too early to know whether special needs children will respond better to simpler robots like Romibo or a more sophisticated device*[*like the 23-inch-tall Nao*](http://www.aldebaran-robotics.com/en/)*. It’s also not yet clear why some children respond to social robots and others do not and how well the learned skills translate to the real world.*