

Annotated References

Abril, D. (January 20, 2016). *The Pitch: RoboKind's humanoid robot generates \$500K, interest in first four months.* Retrieved from: <http://www.bizjournals.com/dallas/blog/techflash/2016/01/the-pitch-robokinds-humanoid-robot-generates-500k.html>

The author discusses an interview with the creators of Milo, RoboKind, giving actual quotes from the interview along with the questions. They talk about amount of funding, future goals, and funding. They also go into depth about how Milo works, which was an important insight to be used in the paper. This article was written in a prominent source used in Dallas called the Dallas Business Journal that discusses different industries and topics within Dallas.

Acapela Group. (December 15, 2015). *Advanced Robots: Meet Milo, an Intelligent Robot That is Really Good at Teaching Children with Autism Social Skills.* Retrieved from: <http://www.prnewswire.com/news-releases/advanced-robotics-meet-milo-an-intelligent-robot-that-is-really-good-at-teaching-children-with-autism-social-skills-562351711.html>

The article talks more in depth about the advanced technology used in Milo, specifically about the features that make Milo stand out among other social robots used previously. They also discuss the use of sophisticated voice technology created by the Acapela Group that uses real children voices to create expression in voices. They provided links to backup their information as well, citing the RoboKind robots website.

Anderson, R. (February 23, 2016). *Meet Milo, a Social Robot Like No Other.* Retrieved from: <https://abilitytools.org/blog/meet-milo-a-social-robot-like-no-other/>

The article was written by the Marketing and Communications coordinator of the site where she met Milo at an international ATIA conference. She talks about her encounter with Milo and features discussed at the conference to provide more insight into the technology behind Milo. She cites the RoboKind website for further information and provides a video link as well to support her statements.

Breazeal, C. (n.d.). *Sociable machines - Overview.* Retrieved February 24, 2017, from <http://www.ai.mit.edu/projects/sociable/overview.html>

This website provides an overview of Kismet and its uses for development during its research. It is published by the research group behind Kismet and helps to provide an overview to the creations of robots that would be able to react to humans with facial expressions. This was the beginning of practicing the research between human and robot interaction put into practice and it has been a driving force for the creation of many different robots afterwards.

Cabibihan, J., Javed, H., Ang, M., & Aljunied, S. M. (2013). *Why robots? A survey on the roles and benefits of social robots in the therapy of children with autism*. International Journal of Social Robotics, 5(4), 593-618. doi:10.1007/s12369-013-0202-2

This journal speaks as to possible future directions for social robots in autism therapy, including updating therapy regimens based on current data, tailoring each program to each individual patient. It also talks about how no longitudinal studies have been done so far, since it is a fairly new topic, and how the studies that have been conducted need to be repeated to confirm their findings. It was published in the International Journal of Social Robotics by four members of academia in Singapore, three from the National University of Singapore (Department of Electrical and Computer Engineering or the Department of Mechanical Engineering) and one from the Ministry of Education (Education Services Division).

Clara Chow (February 25, 2014). *Robotics could be a big step in autism therapy, but stumbling blocks remain*. Retrieved from: <http://www.scmp.com/lifestyle/family-education/article/1434179/robotics-could-be-big-step-autism-therapy-stumbling>

This article talks about the success in using robots as a tool in therapy to teach and accompany children with autism while parents and researchers still have some concerns in mind. The main portion that was focused on for this paper is the control and autonomy concern. The acceptance rate of robots replacing human therapists to teach children with autism are low, meaning that many people are still uncertain if robots can be the one who exert control over human.

Corbly, L. (April 18, 2015). *Robot Milo helps children with autism learn social skills*. Retrieved from: <http://www.deseretnews.com/article/865626671/Robot-Milo-helps-children-with-autism-learn-social-skills.html>

This article talks about the success of Milo in terms of research directed by Rollins, a researcher who worked with the University of Texas at Dallas Callier Center for Communication Disorders. She discusses how he speaks slower than an average human and talks about how social robots

can improve children with autism's understanding of expressions and emotions. She talks about the future hope for autistic children in developing new ways of interacting and learning.

Dautenhahn, K. (1999, August). Robots as social actors: Aurora and the case of autism. In *Proc. CT99, The Third International Cognitive Technology Conference, August, San Francisco* (Vol. 359, p. 374).

This article covers lead researcher Kerstin Dautenhahn's earliest findings on the Aurora project that took off one year before this publication. Dautenhahn worked in conjunction with MIT's Artificial Intelligence Laboratory from the Department of Cybernetics at the University of Reading in Reading, UK.

Dautenhahn, K. (2003). *Chapter 8: Playing and learning with robots. In Future of learning: Issues and prospects* (pp. 163-184). Amsterdam, NL: IOS Press. Retrieved February 23, 2017, from: <http://www.ebrary.com>

This chapter emphasizes that social robots should not replace human contact, but that self-operating features could reduce distractions children might face in therapy sessions. Kerstin Dautenhahn is one of the leading researchers on social robotics in autism therapy.

Dautenhahn, K. (2003). *Roles and functions of robots in human society: Implications from research in autism therapy. Robotica*, 21(4), 443-452. doi:10.1017/s0263574703004922

This journal speaks to how self-operating therapy robots could allow for constant therapy in settings outside of labs, which may help children generalize what they learn in therapy to real social situations. Robots could also record how patients respond to certain techniques. It also mentions how the therapy robots could be built into multi-functional robots, designed for whole families. Kerstin Dautenhahn is one of the leading researchers on social robotics in autism therapy.

Dautenhahn, K. (2007, April 29). *Socially intelligent robots: dimensions of human-robot interaction*. Retrieved February 24, 2017, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2346526/>

This article highlights the nature of human and robot interaction and how the new developments in making these interactions educational and therapeutic are now a trending concept. The main portion that was focused on for this report is the history of artificial intelligence as well as social robots would be created to influence the future. This article was published to the US National Library of Medicine and has been cited by other sources for references with the material.

**iESD. (July 6, 2016). *iESD Case Study: Children on the Autism Spectrum Show Improvement with Robots4Autism in Spartanburg, South Carolina*. Retrieved from:
<http://www.autism-society.org/wp-content/uploads/2016/10/Robokind-Efficacy.pdf>**

This source is an actual case study that discusses the methods and experimental environment created to understand the effects of Milo on children with autism. The study was facilitated in Spartansburg, South Carolina, at McCarthy Teszler school where they found much success in using Robots4Autism curriculum with Milo to help children with autism in ways that they were unable to connect with before. facilitate a better learning environment for the student.

**Firth, S. (March 9, 2015). *Autism Therapy From a Robot?* Retrieved from:
<http://www.medpagetoday.com/pediatrics/autism/50386>**

MedPage Today is a site that shows the new cutting edge technology and news related the health and the medical world. The article goes into depth of the science behind Milo, compiling research and the use of the curriculum along with Milo to fully understand how Milo is being used in classrooms and therapy sessions across the country. It also discusses how seventy Milo robots are in use as well as the monetary value of Milo currently, which is \$5,000.

Giullian, N., Ricks, D., Atherton, A., Colton, M., Goodrich, M., & Brinton, B. (2010). Detailed requirements for robots in autism therapy. *IEEE International Conference on Systems, Man and Cybernetics*. doi:10.1109/icsmc.2010.5641908

This source is focused on the regulations and guidelines created for making therapy robots for autistic patients, but also speculates on what innovations might be seen in the future in this field. It was published in BYU's ScholarsArchive as part of the Computer Sciences Commons and appeared in the 2010 IEEE International Conference on Systems, Man, and Cybernetics.

**Groopman, J. (2009, November 2). Robots That Care. *The New Yorker*, 85(35), 66. Retrieved from:
http://go.galegroup.com/ps/i.do?p=LitRC&sw=w&u=wash_main&v=2.1&it=r&id=GALE%7CA211029143&asid=592fd377866fea7ac6c4c5cc2d3ebe2a**

This article talks about some concerns for the future of therapeutic robots, including certain design implications, as well as ethical responsibility if negative consequences from this technology arise. It was published in *The New Yorker* and was found archived in Gale Literature Resource Center.

Hetzroni, O., & Tannous, E. (2004). *Effects of a Computer-Based Intervention Program on the Communicative Functions of Children with Autism. Journal of Autism and Developmental Disorders, 34(2), 95-113.*

This source is a study that analyzes the use of computer-based intervention to treat children with autism to help them enhance their communication functions. The primary part that was focused on for this report are the design of the software program which are based on the daily life activities of children and the results which indicate that children were having some developments after exposure to robots.

Investigation y Desarrollo (March 14, 2016). *Humanoid robot works in therapy for children with autism.* Retrieved from

<https://www.sciencedaily.com/releases/2016/03/160314211552.htm>

This source introduces a research and the humanoid robot, TecO, built by the research team. TecO is an AI robot to help children with autism to communicate and recognize facial expression. It is discovered that TecO made significant success. Using TecO as a tool in therapy to treat autism has impressive progress in two months.

Irina Lucaciu (July 16, 2013). *Robots: the Answer for Treating Children with Autism Spectrum Disorder?* Retrieved from

<http://www.theneuroethicsblog.com/2013/07/robots-answer-for-treating-children.html>

This source analyzes the challenges of individuals with autism and some of major therapies used for assisting children with autism. Also, it also discusses some studies and researches on social robots used for facilitate therapy of children with autism. However, it concludes with a doubt, arguing if social robots can be fully supported to be therapeutic tools. The source states that it still requires a long-term investigation of the usage of therapeutic robots for children with autism.

Kaspar the social robot. (2017). Retrieved February 24, 2017, from
<http://www.herts.ac.uk/kaspar/the-social-robot>

This site provides the history and development of Kaspar, a social robot created to teach behavioral traits to children with autism. The concept of Kaspar was developed in the late 1900s at the University of Hertfordshire and it has been in development and usage ever since. He is created to look like a normal child and has exaggerated emotions when interacting with children with autism to help make behavioral traits more normalized.

Lee, J., Takehashi, H., Nagai, C., Obinata, G., & Stefanov, D. (2012). Which Robot Features Can Stimulate Better Responses from Children with Autism in Robot-Assisted Therapy? *International Journal of Advanced Robotic Systems*, 9(3), 72. doi:10.5772/51128

This article discusses the different design factors of the robot overall, specifically talking about the implications of robots with more machine-like features. It was published in the *International Journal of Advanced Robotic Systems*.

Özcan, B., Caligiore, D., Sperati, V., Moretta, T., & Baldassarre, G. (2016). Transitional Wearable Companions: A Novel Concept of Soft Interactive Social Robots to Improve Social Skills in Children with Autism Spectrum Disorder. *International Journal of Social Robotics*, 8(4), 471-481. doi:10.1007/s12369-016-0373-8

This study discusses research conducted in the Laboratory of Computational Embodied Neuroscience at the Institute of Cognitive Sciences and Technologies, by members of the Italian National Research Council. It explores the ideation of, prototyping of, and future directions for transitional wearable companions as therapeutic tools for children on the autism spectrum. It was published in the *International Journal of Social Robotics* and retrieved through the Suzzallo Library at the University of Washington from Georgetown University.

PARO Therapeutic Robot. (n.d.). Retrieved February 24, 2017, from <http://www.parorobots.com/>

PARO Therapeutic Robots are robots in the shape of a seal and it has been developed in Japan to reduce stress within its users. It reacts to all sensations and is fully automated to provide feedback to the user and give the user a sense of comfort and company. It's been proven to be helpful and is constantly undergoing research to improve what it can do. This is the official site that hosts information about PARO.

Ricks, D. J., & Colton, M. B. (2010). Trends and considerations in robot-assisted autism therapy. 2010 IEEE International Conference on Robotics and Automation. doi:10.1109/robot.2010.5509327

This paper, published as part of the IEEE's 2010 International Conference on Robotics and Automation, discusses the field of robotic therapy for children with autism on a general level. The growth of research on this topic has spread across many universities. Ricks and Colton discuss the purpose of the therapy and explore current and possible future directions for robot

design features, including a wearable (not developed at the time) and a model with interchangeable components.

RoboKind. (2015). *RoboKind is a leader in the robotics industry*. Retrieved from: <http://www.robokindrobots.com/robots/>

This source is the actual website created by RoboKind that discusses the sophisticated technology that they used when creating Milo. They also discuss the thought that has gone into Milo in creating him to be more lifelike and realistic using an array of speakers, microphones, cameras, and more to achieve feedback and recording technologies.

Robots4Autism. (2015). *Meet Milo*. Retrieved from: <https://robots4autism.com/milo/>

This source is the actual website created by Robots4Autism, the curriculum made in conjunction with Milo by RoboKind. The website provides fully in depth information about the technology used in Milo, such as cameras, sensors, motors, and more. The page has a full graphic that shows the different range of motions and location of sensors and such that are accurate.

Sharkey, Amanda, & Sharkey, Noel. (2012). *Granny and the robots: Ethical issues in robot care for the elderly*. *Ethics and Information Technology*, 14(1), 27-40.

This source discusses several ethical issues in the use of social robots for elderly care. It outlines the development of robots for assisting elders and carers, followed by six ethical concerns. The major concern that is focused for this paper is the potential reduced amount of human contact, regarding the fact of how it is caused and what results it leads to.

Sharkey, A. (2016). *Should we welcome robot teachers?* *Ethics and Information Technology*, 18(4), 283-297.

This article examines the the current uses of robots in classrooms under four scenarios. It carefully discusses the main ethical concerns and how they are presented in four characterized scenarios. Several ethical issues that are raised for this paper includes children's privacy, loss of human contact caused by deception, and control and accountability of robot use. Despite many ethical concerns argued, the article also discussed how robots could be used under limited circumstances.

Social Issues. (2007, April 2). Retrieved February 24, 2017, from https://iancommunity.org/cs/challenging_behavior/social_issues

This article focuses on how behavioral traits and communicational skills develop in a child with autism and how this affects them growing up when they are put in social settings. It dives deep into certain aspects of the brain and how it can children with autism may not be considered to have a typical brain. This is published by the IAN, a community that is created to link the autism community with researchers who want to do good for those who are affected by autism.

Trudy Simpson (March 30, 2016). *Rise of the Healthcare Robots: Five Ethical Issues To Consider*. Retrieved from:
<http://www.cmfblog.org.uk/2016/03/30/rise-of-the-healthcare-robots-five-ethical-issues-to-consider/>

This article first discusses the applications, benefits, and market sizes of healthcare robots. It then lists out the five main ethical issues of using robots for therapy or healthcare, including loss of personalized care, loss of human contact, issue of control and autonomy, patient safety concerns, and finally Possible exacerbation of healthcare and other inequalities.

Tucker, E. (February 1, 2015). *How robots are helping children with autism*. Retrieved from:
<https://www.theguardian.com/lifeandstyle/2015/feb/01/how-robots-helping-children-with-autism>

This article is from The Guardian, a well known site that provides popular topics such as US, politics, world, opinion, technology, lifestyle, and more. The article was about how different social robots are being used to help children with autism, in different ways. The article goes more into depth about the cameras and typical lessons used with Milo.

Walsh, K. (June 30, 2016). *Meet Milo! A Robot Kid that Excels at Teaching Social Skills to Kids with Autism*. Retrieved from:
<http://www.emergingedtech.com/2016/06/robot-engages-children-with-autism-to-teach-social-skills/>

The picture of a child interacting with Milo was used from this source, which discusses further details of the setup and display of how Milo is used in school settings. The source is from a site that follows new and trending educational activities and technologies that can further help children and students learn.

Weir, K. (2015). Robo therapy. *American Psychological Association*,46(6), 42. Retrieved February 23, 2017, from <http://www.apa.org/monitor/2015/06/robo-therapy.aspx>

Robot therapy is a topic that is being researched for all areas of care like stress, behavioral changes, and this article focuses mainly on how robots can help children with autism. It is becoming a key component to personal care because the robots are able to cater their help based on the needs of each individual and it is proven that kids are learning behavioral traits. This was published on the American Psychological Association page and references it's studies from Yale, Japan, and Dutch researchers.

What Is Autism? (n.d.). Retrieved February 24, 2017, from <https://www.autismspeaks.org/what-autism>

This site focuses on describing autism and breaking down what it is so people can better understand how widely spread it is and how it tends to affect children growing up with it. Autism speaks is an organization dedicated to raising awareness about autism and breaking down the stigmas that come along with the term.

Yee, A. W., Kee, T. Y., Limbu, D. K., Jian, A. T., Dung, T. A., & Yuen, A. W. (2012). Developing a robotic platform to play with pre-school autistic children in a classroom environment. *Proceedings of the Workshop at SIGGRAPH Asia*, 81-86. doi:10.1145/2425296.2425311

This research paper discusses the specific implications of using robots with autistic children in a classroom setting. Important observations from this research include realism with a link to children bonding with the robot and the amount of time spent in therapy and the amount of therapy sessions increased when a bond with the robot was formed. The research was conducted in conjunction with the Institution of Infocomm Research in Singapore and was published by the Association for Computing Machinery in 2012.