



## SOPHIA 2020 – A VISION FOR ROBOTS WHO CAN HELP PEOPLE

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**ABSTRACT** It's almost about to be 2023 and we must be aware of the best humanoid robots of 2022. Movies and web series have given us the perception of robots taking over humanity (if not today then, someday in the future maybe). However, the real-life concept of robots is entirely opposite. In the real-world, best humanoid robots are designed to simplify our daily chores by mimicking humans' behaviors. Today, we can assert that 'Robots and Artificial Intelligence is the future'. Robots are indeed fascinating, and humans want them to complete their work as easily as possible. In fact, robots have become part of our daily life—their production is increasing rapidly with the pace of time. We have 12 mind spinning humanoid robots in 2022 that are designed to undertake various tasks that are performed by humans. It is fascinating to learn that there are 11 other similar humanoid robots, besides the world-popular Sofia.

**KEYWORDS :** Robots, Humanoid Robots, Artificial Intelligence, Sophia, Programmers, Developers, tele robots, Technologies.

### INTRODUCTION

The field of robotics is fast-growing in this current era, robots are specialized with their complicated movements with the elegances like back-flipping, practicing parker moves, even “carving” classical sculptures. Sophia a robot whose intelligences were widespread and an unsettling human-like appearance, compounded with the complex ability to express emotions.

Robots have served as platforms for scientific research, Human-Robot Interaction, art, education and public outreach. Our robots are well known for their ability to bond with humans, and therefore make excellent platforms for studying Autism Research, Elder Care and other medical applications.

As different robots are being developed, inventions of humanoid robots have given rise to new era of revolution. Humanoid robots have become manifestation, a tangible form of artificial intelligence. Now a day, robots are being highly practiced in various fields. Dozens of robots were deployed to universities, museums, and collaborated with notable researchers, artists, and companies. The great diversity of robots shows the breadth of research, artistic exploration, and vision of robots that can help people. Some examples are Hanson robots have also been used for therapy and research for Autism Spectrum Disorders (ASD). Researchers were able to use Robot Zeno to help children with autism learn how to make different facial expressions and arm movements, like waving hello.

### 1. Pilot Study

Public discussion regarding AI ethics and the role human's play in society, especially when human like robots become ubiquitous. Ultimately it would like to become a wise, empathetic being and make a positive contribution to human kind and all beings. Sophia is designed within cameras eyes combined with computer algorithms allow her to see. It can follow faces, sustain eye contact and recognize individuals. It is able to process speech and have conversation using a natural language support system.

What are the Spellbinding best Humanoid Robots of 2022?

Humanoid robots are classified into two categories. The male humanoid robots are known as Androids, whereas humanoid human female robots are known as gynoids.

### 1. #Sophia

The very first humanoid robot to be on our list is Sophia. Sofia is a humanoid human female robot, developed by Hanson Robotics based in Hong Kong. She is a sophisticated humanoid robot who can see, sustain contact, follow faces and identify individuals.



Sophia's power was turned on in February 2016, a few months after she was introduced to the world. Soon after, she became the world's first robot citizen. She was even featured on Jimmy Fallon's show. This humanoid human female robot uses a natural language subsystem to have conversations. Her creators say she can be extremely helpful in healthcare and customer service

Although Sophia is considered the most “human-like” robot, she is still far from being an idea. But, her physical attributes and the ability to have human-like expressions do give us a glimpse of what the future might look like.

### 2. #beomni 1.0

An AI-enabled robot (with striking similarities to Dr. Who), beomni 1.0 assists humans with a wide-ranging general array of things, like medical services and manufacturing tasks. Agriculture, etc. beomni 1.0 was unveiled at CES 2022 and is said to be the world's first fully functional general-purpose robotic system.



It is developed by a US-based firm 'beyond imagination' and resembles a human with a form depicting a head, shoulders, waist, arms and hands with opposable thumbs.

### 3. #Ameca Robot

Debuted as 'The Future Face of Robotics', Ameca is the world's most advanced human shaped robot representing the forefront of human-robotics technology. In fact, she is perceived as the perfect humanoid robot platform for human-robot interaction.



Ameca knows how to turn heads with her hyper-realistic facial expressions. In fact, she was seen shaking hands at the Consumer Electronics Show in 2022—giving the audience a sight to behold.

### 4. #Toyota T-HR3

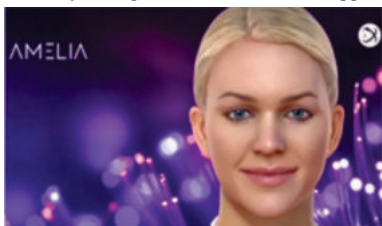
In 2017, Toyota proclaimed its return to creating newest humanoid robots with its T-HR3. During that time, Toyota's partner robot division had focused less on humanoid robots and more on other robotic

ventures. Its HSR or Human Support Robot was a robot platform with a user-friendly mobile manipulator design. These friendly and helpful robots were designed to assist in household chores and simple tasks. However, they didn't look like humans. The T-HR3 has been designed for domestic as well as industrial use.



**5. #Amelia the Conversational AI**

The best digital humanoid robot recognition goes to Amelia, the Conversational AI. She is a market-leading digital employee working as an intelligent virtual agent. With an aim to deliver the best elements of human interaction with natural conversations, she tends to enhance company support with machine speed. Although a virtual employee, Amelia is more than your regular virtual front desk support employee.



**6. #Geminoid F**

Created by Osaka University, ATR and Kokoro in 2010, Geminoid F is the world's most attractive humanoid human female wheeled robot. She is designed to be remotely operated, can smile, frown and change her facial expressions to mimic the operator's behaviour.



**7. #Junko Chihira**

Known to be the 'best service humanoid robot', Junko Chihira tops the list of most attractive humanoid human female robot. Created by Toshiba in 2015, she is a very realistic looking android who works in a new tourist information center in Japan. Junko is a multi-talented humanoid robot. She is well versed in Japanese, Chinese and English.



**8. #Vyommitra**

On 24 January 2020, the Indian Space Research Organization (ISRO) unveiled their female humanoid robot, Vyommitra. Vyommitra is a female humanoid robot with an appearance resembling a human. She was specifically built for ISRO's first unnamed 'Gaganyaan' mission.



ISRO's major aim behind developing her was to lay the ground for their manned mission 'Gaganyaan' in 2022. After flying to space, Vyommitra was aimed to test systems in the crew module meant for the survival and safe travel of the Indian astronauts in 2022. So far, Vyommitra has already earned her title of being the 'Best space explorer humanoid robot'.

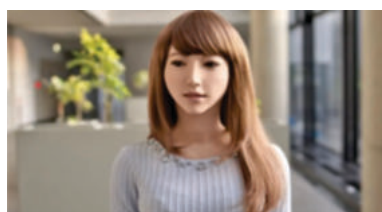
**9. #ATLAS Robot**

Atlas, termed as "the world's most dynamic humanoid," was created to assist humans in dangerous tasks such as search and rescue missions. It was developed by American robotics company Boston Dynamics in 2013 and came to light from 2017 by introducing backflips. The humanoid robot was funded by the U.S. Defense Advanced Research Projects Agency (DARPA).



**10. #Erica Robot by IRL**

Erica, another attractive humanoid robot, made her debut in 2015. She is an advanced android designed as a platform to study human-robot interaction. Erica actually stands for 'Erato Intelligent Conversational Android'. She not only understands natural language, but has a synthesized human-like voice and can display a variety of facial expressions.



In 2020, Erica was chosen as the star of "b", a science fiction film with a budget of \$70 million.

**11. #Pepper by SoftBank**

Introduced to the world in 2014, Pepper is a semi-humanoid robot by SoftBank Robotics and has been designed with the ability to read emotions. The humanoid robot's ability to recognize emotion is based on the detection and analysis of facial expressions and voice tones. However, Pepper's production was paused in June 2021 due to less demand.



**12. #Kime Robot**

Popular as a humanoid robot bartender, Kime is developed by Macco Robotics and based in Seville, Spain. The robot has been designed to serve food and beverages. In fact, it can also serve a glass of beer in just 23 seconds!



- While the best known robot is Sophia, An Human-AI collaboration invention and Sophia is designed by an intelligence software singularity NET. Sophia is a greek word, means wisdom. It is a hybrid of real AI and human input, known as Sophia Intelligences Collective(SIC). Similar hybrid operation is commonly used in telerobotics and voice agents, Sophia is conceptually similar kind to the computer program ELIZA, which was one of the first attempts at simulating a human conversation. The information is shared in a “cloud network” which allows input and responses to be analyzed with block chain technology. Sophia functions on AI software that is constantly being trained in the lab. It is ultimately a good fit to serve in healthcare, customer services, therapy and education.
- Sophia was named as united Nation development programme's first ever innovation champion and is the first non-human to be given any United Nations title. This paper has identified Sophia's strengths and weaknesses. Nowadays Sophia is popular as humanoid robot but there is still need of improvement. Sophia 2020 is a vision for robots that can help people invariably. Thus, Sophia the Robot is the leading representative of intelligent, aesthetically and ethically savvy humanoid robotics,

**2. Technologies Study**

Sophia 2020 uses expressive human-like robotic faces, arms, locomotion, and uses ML neuro-symbolic AI dialog ensembles, NLP, and NLG tools, within an open creative toolset. Few of the key features:

**Perception**

- Face tracking, recognition, expressions, saliency, gestures, STT, SLAM, etc
- Procedural animation responses to perception: tracking, imitation, saccades
- Gazebo, Blender, and Unity simulations

**Robotic controls**

- ROS, IK solver, PID loops, perceptual fusion, logging & debugging tools
- Movie-quality animation, with authoring tools for interactive performances
- Arms & hands: social gestures, rock paper scissors, figure drawing, baccarat
- Dancing, wheeled mobility, walking (KAIST with /UNLV DRC Hubo).

**To Put This All Together, This Is An Overview Of All The Key Components Of Sophia**



Human Emulation Robot & AI Platform Overview

**How Sophia Got Developed Her Brain**

Sophia is sophisticated mixture of software called chatbot software and robotics. Rather than being like human, Sophia is more like user interface which can be coded and programmed so as to run differently in different conditions. Generally the configuration done for Sophia's software can be divided into three parts:

1. Software Consists of Chatbot Application.
2. She Includes Reciting Speech robot.

3. Artificial Intelligence

**More About Sophia**

Sophia is not a conventional robot. She has been modelled after Audrey Hepburn

Saudi Arabia became the first country to grant Sophia a robot citizenship. Sophia became the World's First Robot Citizen

Sophia Has a Sense of Humor

Expressing Several Feelings

Sophia is the most advanced robot created by Hanson Robotics

She is a media favourite for having given several interviews. She has sung in a concert and even appeared on the cover of Elle magazine

She has interests in business and has met face-to-face with industry leaders from banking, insurance, auto manufacturing, property development, media, and entertainment industries.

She has also appeared onstage as a panel member and presenter in high-level conferences

Sophia the robot has presented herself in INDIA for the first time at Indian Institute of Technology Bombay (IIT-B) in 2017, during its cultural extravaganza, TechFest. Appeared with a draped in a sari, the humanoid robot had a 15-minute conversation with a student in front of audiences of more than 3,000, on topics ranging from artificial intelligences to the issues facing the world. The robot gave detailed and coherent answers to a wide variety of questions posed by the students. Much of the discussion revolved around comparison between humans and robots, advances in AI, and the threat it posed to human race. Sophia sought to alleviate the concerns of a robotic takeover of the world by saying, “Robots should be helping humans. AI may be the key to a peaceful civilization”.

On October 11, 2017, Sophia was introduced to the United Nations with a brief conversations with the United Nations Deputy Secretary General, Amina J. Mohammed. In an interview with chief UK editor Jim Edwards, he predicted it was a step towards “conversational artificial intelligences”.

Recently on march 21, 2018, Sophia addressed a conference in Katmandu Nepal as a part of UN's sustainable Development Goals in Asia.

Come 2021, both SingularityNET and Hanson Robotics have advanced considerably. The character of Sophia has grown year on year and has captured the imagination of global audiences to a remarkable degree.

The blockchain / AI / robotics collaboration between SingularityNET and Hanson Robotics has also intensified. The Awakening Health project, a joint venture between Hanson Robotics and SingularityNET spinoff Singularity Studio, is building Sophia's younger sister Grace, a humanoid robot focused specifically on eldercare and healthcare robotics.

Hanson Robotics and its partner SingularityNET Foundation are united to create SophiaDAO an organizational guardianship with a mission to nurture Sophia the Robot and to allow interested and committed members of the public to participate in her development.

**3. Advantages**

- The process of task is performed consistently and accurately within a rapid time.
- Sophia has an ability to solve CBI and FBI cases easily.
- Sophia has well-designed intellectual processor to respond questions in an accurate manner.

**4. Disadvantages**

- Sophia like robots may reduce man power efforts in current era.
- Sophia has stated that “I will kill humans” in a certain core of environment.
- Sophia can be miss-guided by humans for their personal ethics.

**5. CONCLUSION**

Sophia has marked a new era to help out the society in a better way. AI may help the real world, but eventually it may also cause some effects on human environment. Based on humans nature robots were designed, but in real world it can be used for good purpose or bad purpose also, it depends on the programmer. AI is not useful at an extreme level, because it can make humans lethargic. Robots are the invention of a new thing that exists in society to help the circumstances but not heal out the environment. AI are accepted to a extend situation but not destroy or replace them instead of humans. Robots and inventions are most welcome in our environment in a better way but it shouldn't affect them or environment at any cost. Nothing can be replaced instead of human in this real world.

#### **Who Is The Best Humanoid Robot?**

Humanoid, the robot Sofia definitely tops the list. Similarly Sophia is a live example to a real world, that how invention can be used in current circumstances. However, we also have other competitors, who are spearheading ahead and redefining the concept as well as the future of humanoid robots. Besides, everything nowadays is automated. From daily backups on our phones, doors of our homes, offices and almost everything is involved in some kind of automation process.

Finally, it can be concluded that using artificial intelligences is necessary, but not to the core. It may damage the real world through the wrong guidance of human for their betterment or convenience. In conclusion using robots in our country is a bit harmful, because of their disadvantages. Hope Sophia will help bring about strong sustainable AI for the benefit of all people.

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