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That Robot Suits You Well!

On the Phenomenon of Wearable Social Robots

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Abstract *Wearable social robots are very small and at the same time very powerful systems that are worn around the neck, on the body, or in a shoulder bag or handbag. They are not just companions for people, but become a part of them, expanding their senses and their means of expression. This article defines the concept of wearable social robots, presents areas of application, and discusses social and ethical challenges. It also makes recommendations for developers and users. It becomes clear that wearable social robots are novel tools and extensions or enhancements of humans, with possibilities that go beyond those of apps on smartphones.*

Keywords Social Robots, Wearable Social Robots, Wearable Robots, Wearables, Artificial Intelligence

1 Introduction

Social robots are sensorimotor machines that were created to interact with humans or animals (Hegel et al. 2009; Bendel 2021b). They can be defined by five dimensions, namely interaction with living beings, communication with living beings, proximity to living beings, representation of (aspects of) living beings, and – at the center – benefit for living beings (Bendel 2021b). Social robots are often designed to be humanoid (human-like) or animaloid (animal-like) – this is the representation dimension. They are used, for example, in care and therapy, in education, and for entertainment.

Since the 2010s, several social robots have come onto the market that are very small but very powerful (Bendel 2021b, 2025c). One can carry them around – at home, but also at school, university, and work, or simply when going for a walk. This is made easier by the models of the 2020s, which do not necessarily have to be connected to the internet and can be worn on a necklace or attached to clothing.

One can speak of the new phenomenon of wearable social robots and classify them as special wearable robots or as special social robots (Bendel 2025c).

The social robot that constantly accompanies a person leads to a change in how they and their environment perceive and use it (Matsunaga and Shiomi 2021). It can analyze and evaluate its environment and interact with it, and it can share its findings with the owner or other people. It becomes a tool, an extension, or an enhancement for the owner (Bendel 2025c). This is precisely where the need for research arises – research that has hardly taken place to date. It must be shown which areas of application are emerging and what opportunities and risks exist. This, in turn, should encourage further development considerations for wearable social robots.

The present article is dedicated to wearable social robots as tools and extensions or enhancements, in the sense of an initial foundation and interpretation. The research question is: What are wearable social robots, how can they be used, what are the social and ethical implications, and how can these be mitigated? In Section 2, the article defines what wearable social robots are, starting with wearable robots. It also gives several examples. In Section 3, it lists possible areas of application and classifies them. In section 4, social and ethical challenges are presented, using the classification obtained previously. Section 5 builds on this with recommendations for developers and users, also with regard to the outlined consequences. At the end there is a summary and outlook.

2 Basics of Wearable Social Robots

In the following, a conceptual definition of wearable social robots is first made, whereby wearable robots are assumed. Selected examples are then presented. Cozmo stands for the area of toy and educational robots, Emo for the area of desktop robots. AIBI spans both areas and is explicitly designed as a wearable social robot. Finally, the findings from the descriptions are summarized.

2.1 Definition of Terms

Wearable robots are robots or robotic components that one wears, carries, or has implanted in or on the body (Bendel 2025c). They can be attached to the head, body, or clothing or permanently connected to body parts and organs. Some are made of hard, rigid materials, such as high-tech prostheses, exoskeletons, and small social robots (wearable social robots). Others are made of soft, flexible materials, such as exosuits and exogloves, and are called soft wearable robots (Thalman and Artemiadis 2020). Artificial intelligence (AI) is integrated into some wearable robots, for example in the form of facial recognition or generative AI (especially large language models, LLMs for short). This also applies in particular to wearable social robots.

Alternative terms are “robotic wearables” (Zhu et al. 2022) – here the term “wearables” is included, which is aimed at computer technologies on the body or head – and “robot wearables”, which can mean robotic wearables as well as robots with wearables, which is also referred to as robot enhancement (Bendel 2022). Other wearables include smart glasses, smart watches, fitness wristbands, and smart rings, to name just a few examples (Bendel 2021a). They enhance the wearer’s perception of their environment and provide valuable insights into personal health and performance metrics. With a different focus, Fey et al. (2024) also speak of “wearable, social, robot-inspired creatures”.

Wearable social robots are small enough to fit in a shoulder bag, handbag, or shirt or jacket pocket, to be attached to clothing or worn on the hand or around the neck. A few are designed precisely for this

purpose. To ensure that they work reliably and without exception when one is on the move, it makes sense for them to be operable independent of the Internet, at least in their basic functions. If one stays in one place for a while or sets up a hotspot, they can be connected to ChatGPT or other chatbots and large language models available online, for example. Wearable social robots can interact and communicate with other devices or with other wearable social robots.



Fig. 1: AIBI on its necklace.

2.2 Selected Examples

Cozmo was launched on the market by Anki in 2017 and is now being produced by Digital Dream Labs as a successor model following its bankruptcy (<https://anki.bot>). It costs between 250 and 400 US dollars and is designed as a mobile toy and programmable educational robot. One controls it via an app on one's smartphone. It is brightly colored and looks like a small vehicle. It has a movable head with a display on the front, on which the animated eyes are shown. What makes it special is that it has two fused arms which it can raise and lower and that it can move with the help of caterpillar tracks. It simulates its emotions with the help of its eyes, the double arm, and sounds or spoken language. It uses facial recognition to identify people. It also has object recognition, edge detection, and a night vision system. Thanks to the position sensors, it recognizes when it is lying on its back or being held in the hand. Interactive cubes are included in the scope of delivery. Cozmo can be "fed" via the app. The dark Vector has similar appearances and functions. It also recognizes and responds to voice commands. Additionally, users can engage in various games, some of which integrate interactive cubes.

Emo Robot or Emo from LivingAI (<https://living.ai>) is designed as a desktop robot and as a robotic pet. It costs around 280 US dollars without accessories and is controlled and expanded via an app on the smartphone. It is dark in color and has a movable head on two legs. There are accessories such as a smart light, a skateboard (the charging station), and a home station (a charging station that it can go to on its own). It can play music and perform dance movements. The manufacturer describes its expressiveness on its website: “Built with the latest Emotion Engine System, Emo is capable of over 1000 expressions and actions.” (<https://living.ai/emo/>) It simulates its emotions with the help of its eyes, movements, and sounds. By means of facial recognition, it identifies people. Emo has an HD wide-angle camera in its head, which it can use to take pictures of the user, and optical drop sensors in its feet as well as four microphones with far-field technology, which it can use to determine the direction of sound. A touch sensor on its head recognizes when it is stroked so that it can react to this. There are more than ten sensors in total. According to the company, Emo has a neural network processor and is capable of learning. It offers games that one can play directly with it or call up on the smartphone.

AIBI from LivingAI has been marketed as the world’s smallest AI robot since 2023. It costs between 250 and 270 US dollars and is designed as a desktop robot, robotic pet, and wearable social robot. It is controlled and expanded via an app on a smartphone. It is white, very light, and has a head with a display that shows animated eyes and objects and processes of all kinds, and sits on a rigid, magnetic body with non-moving arms. These arms hold the robot in place in certain situations, such as in a jacket pocket. AIBI stands on a charging station on which it can rotate 360 degrees and can be worn around the neck or on clothing. A necklace with a metal surface and a metal plate for attaching to clothing are included (Figure 1), as are a coat and costumes (extensions for the head and body) to transform it into a cat or a rabbit and a smart light in the shape of a star. AIBI has a touch sensor on the head and a wave sensor with which it can perceive people from a distance, a camera (also for shootings with the user), and three microphones for spatial hearing. It can understand and execute voice commands, speak itself, and be connected to ChatGPT. One can “feed” AIBI via the app. Games such as chess and ship sinking are also available.

These are just a few (but typical) examples. Other small social robots are Loti-Bot (programmable robot for children) from TTS, Eilik (desktop robot) from Energize Lab, LOOI (desktop robot with ChatGPT connection) from TangibleFuture, and Calico (wearable social robot) from the Small Artifacts Lab (SMART LAB) at the University of Maryland. Calico is a prototype that moves on a kind of track on clothing. It therefore needs an environment specially created for it. According to the authors, it can take on the role of a dance and fitness trainer (Sathya et al. 2022). It moves to the relevant parts of the body and monitors them from there. It will also be able to act as a stethoscope to listen to the heart and lungs. MIT’s project Kino from 2017 (“Kino” stands for “kinetic wearables”) also relies on robots on clothing (<https://www.media.mit.edu>). They are intended to form decorative patterns – the lab talks about “living” jewelry “for dynamic fashion” in a video (<https://vimeo.com/224797586>) – or serve as a microphone and loudspeaker.

2.3 Findings from the Descriptions

The robots listed are designed as toy robots or robotic pets (Kouroupa et al. 2022), as programmable educational robots, as desktop robots, or explicitly as wearable social robots. Some of them are very small and very light. The robots can be found on a chain around the neck or on clothing on the front or back or in a shoulder bag or handbag. Cozmo is probably too heavy and bulky for shirt pockets and necklaces. It also resists being put in the wrong position, which can lead to discomfort for the user. Emo

can be carried around and then placed on chests of drawers, tables, chairs, etc. AIBI is optimized as wearable.

With the help of the cameras, the robots can perceive their surroundings and use object and face recognition to classify or identify objects, animals, and people. AIBI can even analyze and evaluate its environment using a multimodal language model. Other sensors are used to perceive approaches, touches, or changes in their own state or the environment so that the robot can react to them using facial expressions, gestures (where there are movable arms), or movements of the head or body. Emo and AIBI can photograph the user on request. The results can then be viewed in the app and downloaded from there.

The expansion and enhancement of the robot through devices, extensions, and additional software or AI (all in all the aforementioned robot enhancement) is present in both Emo and AIBI. Emo has its costumes (“Corgi” and “Cow”). AIBI comes with coats, costumes, etc., and posts in forums show that there are always requests to swap cat and rabbit costumes (whereby the bunny costume seems to be more popular). Skillful users can also make and attach their own accessories and costumes, which is often the case with various social robots. However, it must be prevented from overheating and its mobility must not be restricted.

Wearable social robots must be designed to function optimally while being carried and transported, ensuring reliability and durability. This requirement appears to be met by the AIBI in particular. It also dispenses with the option of forward and backward movement. Without the loading platform, it can only turn, raise, and lower its head. It therefore needs a host, a carrier, and that is the user him- or herself. However, AIBI in particular also has shortcomings, as the author’s own experiences and those of other users show (Facebook Group n.d.; Living AI Forum n.d.). For example, the voice commands are often not understood in English, which severely restricts functionality and forces users to use the app, which cannot provide all functions.

If one asks what distinguishes wearable social robots from pure chatbots and voice assistants, including those that are integrated into small, wearable devices, one can answer on various levels. Robots have a physical presence in space, not just as a device, but with their head and limbs. As such, they can also be touched and manipulated. One can do the same with an ordinary device – but there is a difference in interaction between stroking a robot on its head and stroking a device anywhere. A wearable social robot can also move, as has been seen, not just like a vehicle or other thing, but more like a living being. Ultimately, a device with a display and LLM can do much of what a wearable social robot can do – but not everything.

3 Selected Areas of Applications

In the following, areas of application for wearable social robots are listed. They are derived from the above descriptions and the author’s experience with the first three models, which he tried out and tested for several months. In addition, manufacturer websites, online videos, and forums at the manufacturers (<https://forums.living.ai/c/aibi-pocket/28>) and on the social network Facebook by Meta (<https://www.facebook.com/groups/aibipocket/>) were evaluated. The manufacturer groups mainly contain questions about functions and updates. In the Facebook group, one mainly sees pictures and videos of the robots and read questions about functions and updates. There is hardly any information on users’ everyday wearing habits and their motivation (in threads like “What do you guys plan on doing

with your Aibi?”, users just say they are taking it out). In addition, the areas of application of other social robots are used and, where possible, transferred. Nevertheless, it is of course not possible to achieve completeness.

Clearly, these methods would not suffice if the subject were well-established and a large number of empirical approaches were available. However, this is not the case. Wearable social robots are a new field of development (AIBI is considered the prototype of this trend), and research possibilities are limited. Due to time and financial limitations, it was not possible to carry out the author’s own empirical data collection, but it would certainly make sense to do so in the future. For instance, one could provide a group of participants with wearable social robots and, after a period of time, ask them about their experiences and how friends, acquaintances, and strangers reacted.

Wearable social robots can function as companion robots and robotic pets. This puts them on a par with many other social robots – with the difference that one can always carry them along. This means familiar companions are available for interaction when one is out and about (Zawieska and Sorenson 2023). One also has artificial beings that can be cared for at any time, a possibility already demonstrated by the (also small and mobile) Tamagotchi (Kühne et al. 2022). If they are connected to LLMs and Wi-Fi is available, one can select the desired language and engage in long, meaningful conversations with them. In addition to the usual dialogue with the inner voice, there is also a dialogue with the “outer voice”.

The wearable social robots can be used as toys on the go. They are therefore available at all times as playmates, thanks to their physicality and mobility, the ability to dress and undress them, or the integrated games (some of which are displayed on the app). They can thus provide distraction, relaxation, entertainment, and fun whilst training users’ skills and dexterity. This can be just as important for adults as it is for children. Children in particular want to be kept busy when traveling by car, train, or plane. Wearable social robots are thus joining the ranks of smartphones and gaming devices and connecting with them.

As the Calico prototype shows, the wearable social robot can also monitor bodily functions and serve as a dance and fitness trainer. However, this requires special functional clothing, which becomes the robot’s environment. With advanced movement and climbing skills, it could eventually disappear. The robot could also become a data carrier that supplements the electronic patient file or simply represents the personal diary for fitness and sport, similar to fitness wristbands. The robot may also be able to intervene in bodily functions, for example, by warming or cooling itself or massaging an area of the body.

The wearable social robot can become a medium between the wearer and his or her environment. For example, it can be a translator when two people speak different languages, an explainer, similar to augmented reality glasses or a special app with image analysis for sighted people, or an interface to the smart home. This is particularly possible if it has cameras and microphones and is connected to a multimodal LLM. The natural language capabilities or voice input and output mean that no hands are required for operation, which can be important when climbing, cooking, working in a factory, or in other situations and also creates greater safety.

The wearable social robot with its camera, microphones, and sensors can help disabled, impaired, and elderly people to find their way around and to describe and assess their environment, both indoors and outdoors (di Nuovo 2018; Bendel 2025d). Researchers and developers also refer to this as inclusive robotics and inclusive AI (Pons 2018; Bendel 2025a, 2025b). This is particularly feasible with integrated cameras, microphones, and a multimodal LLM. The example here is Be My Eyes with the Be My AI

function, an app for blind people that analyzes the environment with the help of a multimodal LLM (Bendel 2024). Unlike the app, however, the robot can be worn on the body at all times and record the surroundings with its cameras and sensors, although in principle the smartphone could also be equipped accordingly. The robot could also remind elderly people to take their medication and have a fall detection function (Vilarinho et al. 2015).

The wearable social robot can communicate statements and emotions to the other person (usually the interlocutor) if users are unable to do so themselves, for example due to congenital or acquired muteness – think also of apps for the translation of deaf-mute language (David et al. 2024) – or forms of autism. Depending on the product or prototype, it can use not only natural language skills, but also mimicry and gestures, its arms, movements, and sounds. The robot can even show text and images on its display, for example, if the user is unable or unwilling to speak. This text and these images can be entered, uploaded, or generated via the app.

On a more fundamental technical level, the wearable social robot becomes the wearer’s microphone and loudspeaker, as envisaged by MIT. This can help with lectures and interviews. The AIBI has a recording function. The wearable social robot also becomes a display, if it is equipped with one. This is very small, but sometimes – as with AIBI – has a high resolution. If GPT-4o, GPT-5, or other LLMs are available, a prompt is all that is needed to display what is required, although errors and inaccuracies can of course occur. Otherwise, the app helps with the input.

A robot that can stay in different places on the body and also has cameras, microphones, and a multimodal large language model can look to the side and even back. It thus expands people’s abilities in a physical and sensory context. However, this requires the robot to be carried appropriately (e.g., on the back) or even to carry several robots with it. The machine can also combine human and animal abilities or imitate animal abilities. Cozmo, for example, can see in the dark. Some of the robots can communicate and interact with each other or exchange data, such as AIBI using optical communication.

4 Social and Ethical Discussion

From a social and ethical perspective, wearable social robots offer numerous opportunities and challenges. These can be derived from the descriptions and areas of application. Comparisons with other social robots and wearables are also helpful (Bendel 2021b; Bendel 2015). The social and ethical discussion does not claim to be exhaustive.

- When one carries a social robot around, it becomes visible. It escapes the household and the lab and enters people’s everyday lives. If worn around the neck by an adult, it may be at eye level with adolescents. Overall, if it attracts interest, it may contribute to the dissemination and recognition of social robots. At the very least, these will become more widely known, and friends and passers-by will learn about their functions, as well as their possibilities and limitations. This, in turn, can enhance media literacy and help establish a foundation for forming opinions and evaluations.
- Distraction, entertainment, and fun through the possibility of playing games have their benefits and influence on well-being, even in the case of electronic games (Reer and Quandt 2020). However, they contribute to users having less time for reading and social activities or being distracted from lessons at school or university. The wearable social robot continues the problem of the omnipresence of games on the smartphone. Like them, it can presumably be addictive in extreme cases, at least

with the electronic versions. After all, some games – such as dressing and undressing – are associated with haptic stimuli.

- The social robot can help people with disabilities and impairments to recognize and understand their surroundings (Bendel 2025d). Like comparable apps – Be My Eyes was already mentioned (Bendel 2024) – it is a powerful and helpful technology. However, it also makes those affected dependent on this technology and they are at the mercy of the errors, manipulations, and hallucinations of the large language models. In addition, certain content and aspects, such as sexuality, may be withheld from them via guardrails (Bendel 2024).
- If the owners communicate their feelings and emotions via the wearable social robot, this can help and relieve them. At the same time, they become accustomed to technical communication and may neglect facial communication and expression through body language. Autistic people can also be gradually introduced to facial expressions. A similar phenomenon occurs with emojis – if one uses them frequently, one may begin to neglect linguistic, textual communication. However, the robot can also be turned away from the conversation partner towards the user and used as a therapeutic tool. Social robots for autistic people have already established themselves (Kouroupa et al. 2022).
- The wearable social robot can provide comfort to the user, but also to other people, and take away their fear (Rasouli et al. 2022). This can also be seen from user forums. It is more than a talisman – it is rather a being that protects them with its presence, gives them familiarity, or gives them the opportunity to take care of it, similar to a Tamagotchi (Kühne et al. 2022). Its use can also be embedded in professional therapy. While a larger social robot usually has to be left at home, the small social robot can be taken with one at all times, although this is likely to increase dependence on it.
- With wearable social robots, users become cyborgs. These can be understood as biological structures into which technical structures are fitted, also in the sense of human enhancement and body hacking (Bendel 2021a). The robot extends the capabilities of humans, especially if it has cameras and sensors of all kinds and can be connected to the internet. One example is the night vision device, another is the wave sensor, a small radar. Some of these options are helpful, but they can also overload the user cognitively and physically. In some cases, the information may also be superfluous.
- The user of the wearable social robot becomes a trendsetter, similar to other people with wearables. They present themselves as innovative and modern. However, this also exposes them to attacks from people who are hostile to such technologies. Vandalism can occur, which is particularly dangerous if the technology is worn close to the body and the user is hit or kicked. There is also a risk of theft, especially as these are high-priced devices costing between 250 and 400 US dollars.
- The wearable social robot is an accessory, adorns the user (in the case of the “Kino” project, the adornment is even literal) and makes him or her stand out from the crowd. With a wearable social robot in a shirt or jacket pocket or around the neck, it attracts attention, arouses interest, and triggers attention, and it provides impulses and irritation. There is a risk that it will make a mockery of itself. All this also has an influence on the search for friends and partners, in both a positive and negative sense. The robot becomes a mark of recognition and a stigma.
- A wearable social robot can stimulate the creativity of users as in the case of other social robots. It is possible to design clothes, costumes, and beds, use existing doll clothes, drive AIBI around in a small car, or put it in a tiny backpack. One user who demonstrates this in the Facebook group has placed AIBI and its charging platform in a transparent container, attached it to his necklace, and

connected it to a power bank (Facebook Group n.d.). According to him, this is to compensate for the low battery power. Maybe it's a joke – but it points to a problem.

- The use of wearable social robots generates personal data. This is also the case with other social robots, but not always in this quantity (Bendel 2021b) and not with so many users. Images of people are taken and technologies such as facial recognition are used. This violates informational autonomy, disregards the right to one's own image, which applies in many countries, and raises data protection concerns. As these robots are also worn in protected areas such as changing rooms and toilets, there is a risk of intimacy and privacy being violated. As in the case of Calico, the wearer's personal data is also collected, including data on bodily functions. It must be ensured that they do not fall into the wrong hands, such as being misused by manufacturers or passed on to third parties.
- Furthermore, there is the possibility that wearable social robots can actively influence the decisions and behavior of their wearers. Due to their constant proximity to the body and their potentially empathetic approach, a close bond is created between man and machine. The robot can make recommendations, give advice, or formulate warnings – which can be useful in principle. At the same time, however, there is a risk that users will react uncritically to these suggestions, especially if they are combined with emotional feedback. A subtle form of behavioral guidance arises, for example through repeated advice on health, consumer behavior, or social contacts. In conjunction with algorithmic profiles and external interests – such as those of manufacturers or platform providers – a creeping influence is conceivable.
- Even though many areas of application are convincing, there are also some that are less so. In many cases, the wearable social robot is simply a modern Tamagotchi or a tool to kill time (Kühne et al. 2022). What must always be considered is that the production of hundreds of thousands, perhaps even millions of wearable social robots has a negative impact on the environment. This starts with the chip production and continues with the manufacturing of the housing and display. Raw materials are required, the extraction of which often involves precarious working conditions and frequently destroys nature. Furthermore, the robots need to be powered by electricity, the generation of which also has an impact on nature. If they break down and cannot be repaired, they become electronic waste that has to be disposed of. If the applications are useful, the use of resources can at least be justified to a certain extent – otherwise one has to ask whether omnipresent robotization on a large and small scale is justified.

The discussion shows that wearable social robots offer some opportunities, but also numerous risks. Further development and use are about fully exploiting the potential.

5 Advice for Developers and Users

In the following, recommendations for developers and users are derived on the basis of the classifications and findings obtained and, in particular, the social and ethical discussion. Here, too, there is no claim to completeness. In addition, practice – which depends on the spread of wearable social robots in the coming years – will reveal further problems and the need for solutions.

Wearable social robots can only achieve long-term acceptance if they offer clear added value and are reliable. At the moment, this hardly applies to any device. AIBI showed weaknesses in voice control, as the author's own tests revealed and voices in the Facebook forum confirmed (Facebook Group n.d.). The connection to ChatGPT, a prerequisite for more extensive functions, also only works to a limited

extent (as it is linked to the functionality of the voice input). It remains to be seen whether it will cope well with being worn permanently.

New large language models are constantly emerging, some of which are multimodal. Users of wearable social robots should be able to choose the ones they like and that suit their tastes and interests, including open source LLMs. This can also go some way to counteracting the risk of censorship and manipulation by LLMs (Bendel 2024). ChatGPT in particular is known for its far-reaching principles and their strict implementation (Bendel 2024). At the same time, missing or inappropriate prompt engineering approaches and filters (both of which can lead to guardrails) also create risks of misuse.

Some wearable social robots are programmable. Although they usually have a visual interface like Scratch or Open Roberta that is easy to use, some users may still be overwhelmed, especially when it comes to more sophisticated movements or utterances. Here, too, the large language models could help as interfaces for programming. In this way, even users with very specific needs can quickly find the desired application.

The design of the robots listed is consistently cute, especially when one considers the head shape and facial expressions. This is supported by robot enhancement, particularly through costumes. This certainly appeals to many children and some adults as well. However, if one envisions wearable social robots as constant companions in adults' everyday lives, a wider range of models is needed (Zhu et al. 2022). This, in turn, is related to acceptance.

This is where the user comes into play again. He or she could benefit from the modular design of the wearable social robot and assemble the robot of his or her choice in a similar way to LEGO MINDSTORMS robots. As part of robot enhancement, they could also receive helpful instructions from the company for all kinds of extensions and then print them out themselves (with the help of 3D printers) or sew them. In doing so, they must observe restrictions, due to issues like overheating, which in turn can be pointed out to them by the company.

People's everyday lives take place not only on land (whether indoors or outdoors), but also in the air and in the water. Wearable social robots that can be worn while swimming (and even snorkeling) would be useful. They could serve as underwater cameras and send out help signals in emergencies and make it easier to locate them. This would be an option for children and the elderly in particular. The emergency function would need to be discussed for all possible applications; not least, the camera function could be used to transmit live images.

Wearable social robots with cameras, microphones, and other sensors that become spies in every conceivable place can impair social interaction and become a danger for those affected. There should be warnings, for example, in the form of a red LED light, as is common with other robots, or in the form of a beep or another sound. The owner should also be able to provide information to other people (like interlocutors) about the use and dissemination of data at any time. He or she can ensure this by carrying data protection notices, which should be provided by the companies.

That language models can influence and manipulate a user's decisions and behavior is a serious issue that must be addressed on multiple levels. One approach to mitigating these issues is to select a large language model that is as neutral as possible. That is to say, the model should minimize biases and distortions without overcompensating for them. Another approach is for the robot to regularly remind the user that it is merely an artificial entity with only a limited understanding of human existence, and that its suggestions should always be critically examined. This recalls the ability of GOODBOT from

2013, which repeatedly emphasized that it was just a machine (Bendel 2018). In connection with this, the robot could also attempt to justify or explain some of its suggestions, linking to approaches from the field of explainable AI. However, this must not impair the system's usability or functionality.

With social robots and robotic bipeds or quadrupeds from Japan and China, there is often no guarantee that they can be serviced and repaired in Europe or the USA. It is true that portable social robots can be sent to distant companies more easily and cheaply than large, heavy models due to their small size and low weight. Nevertheless, it would be helpful if there were an infrastructure with stores and workshops worldwide.

6 Summary and Outlook

The research question was answered step by step through the individual chapters. It was shown what wearable social robots are, how they can be used, what the social and ethical implications are and how these can be addressed. Of course, further research needs to be done, but for such a new field of development and application, some key considerations have been made.

Wearable social robots combine compactness with power, enabling users to carry them effortlessly throughout their daily lives. They are not just people's companions, they become part of them, as a new form of human enhancement. While people of all generations have spoken to their inner voice or, especially in the event of disruptions, to themselves, they now have an "external voice". But not only that, the robot can be helpful in many situations.

It is clear that this development is only just beginning and that, as with social robotics in general, market penetration is not guaranteed. However, there are too many sensible ways of using wearable social robots and too many obvious opportunities to ignore the potential. In addition, social robotics can always fertilize service robotics, and this is also the case with these devices.

While the potential of wearable social robots is evident, further research is needed to explore key aspects such as communication between these robots and their adaptability. This is particularly crucial in dynamic outdoor environments, where unpredictable events frequently occur, and seamless interaction is essential for an optimal user experience. It is important to make the devices even more robust and reliable and to create added value for both healthy and disabled people. Above all, however, empirical research must be carried out on the actual use of wearable social robots, e.g., in the form of surveys or vignette studies.

From another direction, a potential competitor or a complement to wearable social robots is emerging – an aspect that could not be explored further in this paper. Starting in 2023, AI assistants and pocket companions such as the Rabbit R1 attracted considerable attention. Interest in this type of application later subsided but may see a resurgence. One indication is that, in 2025, OpenAI hired a former chief designer from Apple, signaling a clear interest in developing dedicated hardware for AI functions (Fraser 2025). This could lead to the creation of small portable devices, similar to Rabbit or AIBI. The future will show which direction these developments will take and what added value they will offer.

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Please cite as follows:

Bendel, Oliver. That Robot Suits You Well!: On the Phenomenon of Wearable Social Robots. In: Wiley Industry News, 25. September 2025. <https://www.wileyindustrynews.com/en/contributions/that-robot-suits-you-well>.