

# Research on Human-computer Social Interaction Design in the Era of Artificial Intelligence

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**Abstract:** With the improvement of China's scientific and technological level, the relevant technologies are constantly updated, and the era of artificial intelligence is gradually coming. In such background, with the rapid development of human-computer interaction technology, there appear a great number of intelligent equipment and devices, which can realize human-machine interaction and even emotional communication and social communication. Such technologies can not only make people's life more smart and convenient, but also change the way of human life and social situation, which place great importance on China's social development. Therefore, this paper focuses on the design of the human-computer social interaction in the era of artificial intelligence. Firstly, it introduces the relevant overviews of artificial intelligence and human-computer interaction; Then it makes a case study on the design of the human-computer social interaction based on intelligent equipment; At last, it proposes some suggestions for the development for the human-computer interaction technology so as to provide support for related work.

**Key Words:** artificial intelligence; human-computer interaction; social interaction; design research

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## 1. Introduction

In recent years, we witnessed China's rapid development in science and technology as well as in network technology, and we are also encountering the developing upsurge in technologies like artificial intelligence and virtual reality technology put forward a few years ago. And the interaction design and human-computer interaction or related disciplines have also attracted much attention in the society, and the organic combination of the two will provide better environment for the further development and research of relevant technologies and will achieve a good results. However, there appear some problems in the corresponding technologies during the research. Although interaction design is developed from human-computer interaction, interaction design has been separated from human interaction after numerous researches and practices and has become an independent field. The purpose of interaction design is to make full use of the personnel and things by using artificial intelligence. Nowadays, with the rapid development of Internet, researches on artificial intelligence has gradually turned to study on interaction patterns and behavior, and insert emotional and social communication as well as logical cognitive model in interactive behavior to make forward feedback and backward feedback, so that it can realize the human social interaction and emotional interaction and improve people's experience in human-computer interaction<sup>[1]</sup>. Artificial intelligence is not only the background of the era, but also the premise to realize the sociality and intelligence of machines. At present, many researches have fully considered the sociality in interpersonal communication and the superficial expression in interpersonal interaction, but failed to deeply analyze the human-machine relationship. Machines are usually used as a medium for communication. With the improvement of machine intelligence, the emotional interaction between humans and machines is gradually shown, fully highlighting the emotional and social nature of intelligent machines, and providing new topics for subsequent research.

## **2.Relevant overview**

### **2.1 Overview of the Human-machine interaction**

There is a close relationship between the development and progress of interactive technologies, among which artificial intelligence is one of the most crucial interactive technologies. To make full use of artificial intelligence will play a great role in improving the design level and dimension development of interactive technology. First of all, there is an antagonism between the generation of artificial intelligence and the initiation of interactive behavior. This is because in the initial formation period of interactive behavior, relevant scholars only explored human-machine interface based on artificial intelligence. Secondly, the enlightenment period of artificial intelligence echoes the initial development stage of interactive behavior. Since the concept of human-computer interaction was put forward in 1976, relevant disciplines have gradually studied human-computer interaction and exerted influences on various artificial skills, network communication and other technologies, thus interaction design came into being.

The artificial intelligence technology gradually developed from non-intelligence to intelligence. During its development, we can adopt viable artificial intelligence technology and super artificial intelligence technology to realize the intellect logic by making the native emotion subjects abandon their primary physiology, and implement the transformation of human thoughts from Newton thought to the quantum thinking, etc., which is gradually evolved into the diagnosis of a certain behavior based on the prediction of a target. The ultimate goal of the development of artificial intelligence is to use artificial intelligence technology to realize automatic decision-making. Variety of information architecture and the experience mode made their efforts to promote the evolution of transformation from metadata to knowledge and wisdom to information, in which the transformation from wisdom to inspiring users' experience should be a kind of services based on a certain algorithm. Such transformation can realize the combination between the individual small data and cloud big data and finally realize a constant interaction behavior and system and expand the corresponding physical information space into the digital space.

## **3. Application cases of human-computer social interaction**

### **3.1 Volkswagen Beetle**

In human-machine tools design, the most important things are usability and viability as well as the fluency of interaction. After the emotional design model meets the basic requirements, it is necessary to consider the impact of design on human sociality and emotion. Cars are the most typical mechanical tools and transportation tools, taking Volkswagen Beetle as an example. Launched from 1938 to 2003, the Volkswagen Beetle was the best-selling design in automotive history. It had a unique emotional design, with a round headlight to represent the anthropomorphic eyes, a spoon-shaped thinking headstock, and a downward curve to represent a smile. The headstock is designed based on the aerodynamic conception, and conveys optimism, hope and interesting attitudes towards human. Human culture has changed dramatically over the past few decades, but people can still obtain a common emotional connection from the Beetle, which is why the Beetle has been a huge success in design.

Analyzing the human-machine design from the perspective of emotional design, the Beetle design with the “smiling face” creates a simple interaction of “smiling - feedback”, which is successful in stimulating the positive emotions of human. Such design can also make the car form a role with special personality emotion and achieve the goal of human social interaction<sup>[2]</sup>.

### **3.2 Bots**

Bots, also known as chatbots and intelligent robots, are intelligent dialogue systems designed based on natural language processing systems to help and simulate human dialogue activities. They are used in mobile terminals like mobile phones and the PC terminals. We can use virtual robot to realize the sending and receiving of the messages in the

conversational interface and make the robots complete the conversation. There are two kinds of virtual robots, namely, non-conversational robots and conversational robots.

Virtual intelligent robots can understand and answer questions posed by people, such as Apple's collection of Siri, Google's Assistant, and Microsoft's voice assistants like Cortana and Bing, which are all chatbots. In the common chat software WeChat and QQ, there are also many chatbots. In the beginning, intelligent robots also had certain creative abilities, such as Microsoft's Bing, which was able to write poems by memory through using a specific algorithm and it had published its collection of poems "Sunshine Lost its Glass" in 2017.

Virtual robots were greatly development in 2016. Major Internet giants have increased research efforts on them and started mass production, from Facebook's Messenger to Google's APLAI, from Microsoft's Bot Framework to Apple's third-party voice access like Siri, etc. At present, the further development and research on related technologies have greatly improved the intelligence level of virtual robots, and they can also be competent for some human work and communication. The appearance of virtual robot represents the breakthrough and innovation of various softwares in the era of artificial intelligence. Virtual robots provided editing services for human life by creating a life landscape, which further improved people's life quality. The Bots system using man-machine dialogue can realize multiple rounds of dialogue, which has a better effect in social interaction than other search engines.

### **3.3 Intelligence speaker**

The intelligence speakers, as one of the examples of human-machine social interaction and a product of "social interaction + consumer-oriented TOB service", is widely used by its characteristics of high cost performance, prominent advantages in function and intelligence as well as humor and small size. Among them, the most representative and most widely used is Baidu's Xiaodu, Huawei's Xiaoyi, Xiaomi's Xiaoai and Tmall wizard and so on. Xiaodu is more suitable for family use, which supports Bluetooth call and equipped with functions like Bluetooth networking, universal remote control, voice control, voice message, etc. Such equipment is instrumental to a certain extent. It can execute the instructions given by human beings, and can update the networking and push information after networking. It mainly interacts with human beings through indicator lights and voice communication, etc. and achieves its social functions.

## **4. Suggestions for human-machine interaction design**

To deeply anthropomorphize on machines and equipment, anthropomorphizing refers to endow the unique characteristics of human beings with non-human entities to form the tendencies and morphologies of human[3]. As for the current development, although some scholars regard anthropomorphizing as a negative cognitive bias and immature technical behavior, a large number of studies and experiments prove that anthropomorphizing has a good impact in most cases. For example, anthropomorphizing nature can enhance people's awareness of environmental protection, and anthropomorphizing animals can promote people's awareness of animal protection. Xiao Ai, the most widely used intelligent housekeeper in the market, when endowing people's characteristics with other creatures or products, can have a positive effect on its users.

For sellers, it can increase sale amounts and sale results for the sellers to endow human characteristics with products. Artificial intelligence products on the market can be better integrated into users' lives by anthropomorphizing them, and meanwhile, users can also get better experience. The anthropomorphizing behavior to the intelligent housekeeper system can also help the housekeeper to adjust its contents to adapt human life and help the product to further position itself, which is another way to explore the human-computer interaction in the field of psychology. At present, researches from psychologists have proved that the application of anthropomorphizing in artificial intelligence system is also an important tool to study human psychological activities by inferring human psychology through their behavior.

To anthropomorphize the artificial intelligence product is also an important part of emotional design in interaction design. By buying an intelligent product, the users will not only experience the function of the artificial intelligence but

also social and emotional communication, which will help users improve their life quality by using virtual housekeeper and also help the product created emotional communication. According to current big data and researches on the user's psychology, it is helpful for the users to better understand machine language through anthropomorphizing the artificial intelligence machines and making it more intelligent in social communication ability and emotional output ability. What we need to do is to create a kind of human-machine interaction similar to human-human interaction so as to meet the emotional needs of the users when using the products.

## 5. Conclusion

In general, when researching on human-computer interaction technology under the background of artificial intelligence, it is necessary to explore the possibilities of the human-machine interaction in future development from the perspective of mutual influence. In the future research and development of human-computer interaction technology, cooperation and design with other disciplines to make technology transform into better productivity will create more value for people's lives. By reflecting on the development of intelligent machine technology, we will push human wisdom to the peak relying on the development tide of artificial intelligence and broaden people's vision and bring new experience to human life.

## Reference:

- [1] Zhang Zhenghang. Research on the Influence of Emotional Design on Interaction Design in the Era of Artificial Intelligence [J]. MING (Attitude), 2020(11):27-29.
- [2] Zhu Ming. Research on Emotional Interaction Design in the Context of Artificial Intelligence [J]. Digital Space, 2020, No. 176 (06):10-10.
- [3] He Lan. Application Research on Artificial Intelligence Technology in Product Interaction Design [J]. Science & Technology Economy Market, 2020(08):9-10.