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RESEARCH ON ANTHROPOMORPHIC VISUAL IMAGE OF DIGITAL AVATAR OF INTELLIGENT CHATBOT

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The anthropomorphic design of intelligent chatbots in the context of communication and interaction with human users is analyzed. The need to study implementation methods, design principles, and evaluation methods of the anthropomorphic design of the digital avatar of intelligent chatbots, as well as the design and development stages of the product, was determined.
Key words: design, chatbot, anthropomorphic, digital image, human-robot interaction

INTRODUCTION

With the continuous development and application of artificial intelligence technology, intelligent chatbots have become an indispensable part of people's life and work. However, traditional chatbots often give people a feeling of indifference, lack of affinity and human characteristics. In order to better meet people's needs, researchers began to design intelligent chatbots as anthropomorphic forms of digital avatars to make them more humane and approachable. The anthropomorphic design of the digital avatar simulates the interaction between human beings, involving the simulation of voice, appearance, behavior, emotion and other aspects. This design can enable intelligent chatbots to better communicate and interact with human users, improving user experience and satisfaction. This article will explore the application of digital avatar anthropomorphic design in the field of intelligent chatbots, and conduct research and analysis on its implementation methods and effect evaluation

PURPOSE

The purpose of the study is to provide a theoretical basis for the visual design of the digital avatar of the chatbot dialogue system by analyzing the research status quo of the anthropomorphic design of the digital avatar of the intelligent chatbot.

RESULTS AND DISCUSSION

In general, when people refer to a chatbot, they are referring to the whole set of systemic services that users interact with. For instance, when discussing Siri, we do not separate and understand the application itself that interacts with the user on the mobile phone. However, from a design perspective, the user interface that

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connects users and the system, the program that provides services behind the system, and the language used in human-robot communication belong to different design research fields [4]. Due to the variety of media that can carry language, such as text, speech, gestures, and symbols, the human-machine dialogue modes of chatbots also differ. Currently, the two mainstream types of chatbots are voice chatbots and text chatbots. Due to the varying applicable situations, the design methods and research focus of the two types differ significantly. In contrast, the design of text chatbots is more concerned with language and conversation, while the design of voice chatbots is more focused on the media properties of the digital avatar of the user interface [3].In this paper, the term "chatbot" refers to a type of text-based, non-embodied robot software that can communicate with people in natural language and interact with users through various means, such as text, voice, images, and others, and provide automated solutions to user problems.

Anthropomorphism refers to the process of attributing human characteristics and behaviors to non-human entities or concepts. In the context of visual design of digital avatars, anthropomorphism can be utilized to make AI assistants, chatbots, and other digital entities more human-like and approachable, thereby enhancing their interaction and communication with human users [2]. Anthropomorphic design involves endowing digital entities with human-like attributes such as facial expressions, body language, and movements, and utilizing interaction patterns that align with human language, cultural, and psychological expectations. The objective of anthropomorphic design is to facilitate users in understanding and interacting with digital entities by mimicking human interaction and behavior patterns.

Anthropomorphism is an effective tool in digital design that enhances product approachability and believability, thereby increasing user satisfaction and loyalty [1]. In the visual image design of digital avatars, intelligent chatbots, and other digital entities, anthropomorphism is widely used to design virtual characters, icons, and graphic user interfaces. Through anthropomorphism, designers can make digital products more aligned with human needs and psychological characteristics, enhancing users' emotional resonance and experience. However, it is crucial to consider the needs and expectations of users fully. Excessive anthropomorphism may cause confusion or misunderstanding, which could harm the overall user experience. Therefore, a balanced approach is necessary while designing digital avatars to ensure that the anthropomorphic features are appropriately aligned with users' expectations.

The application of digital avatars is extensive, ranging from conveying information and providing entertainment to creating art and enhancing user experience in various fields such as film, animation, gaming, advertising, and education. For instance, companies can leverage digital avatars as brand ambassadors to communicate product information and brand image to consumers. In the education sector, digital avatars can be employed to develop virtual laboratories and simulate experimental scenarios to improve students' learning efficiency and interest. In the realm of artificial intelligence, digital avatars can be utilized as visual image design for human-robot interaction, including chatbots and virtual assistants. Notably, Microsoft's Xiaobing, Apple's Siri, and Amazon's Alexa

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are all smart assistants that leverage digital avatars as interactive interfaces. Figure 1 is the visual image design of the existing voice chatbotdigital avatar.

a   b   c
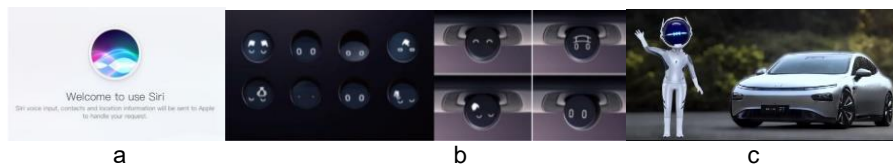
Fig.1. Chatbot digital avatar: a - Apple's Siri; b -Xpeng Motors' voice assistant Xiao P; c -NioosNomi

Intelligent chat assistants are ubiquitous anthropomorphic non-human objects, and their digital avatars' anthropomorphic visual interaction design has become a vital performance indicator for human-robot interaction (HRI). Improving the anthropomorphic feature expression of chatbotobot digital avatar visual design has therefore become a crucial research task in the field of interaction design. To better interact and communicate with users, chatbots' digital avatar design is increasingly anthropomorphic. Anthropomorphic design refers to applying human body and behavioral characteristics to chatbot digital avatar design, to make them more human-like and achieve a more natural, comfortable, and pleasant HRI experience. The visual aspect of HRI is an essential consideration in anthropomorphic design, and an intelligent chatbot's digital avatar should have human facial expressions, body postures, and other characteristics to better simulate human interaction. Additionally, the anthropomorphic degree of the digital avatar can be further enhanced through voice simulation, including intonation, speech speed, and other factors.

CONCLUSIONS

The anthropomorphism of the visual image of the digital avatar of intelligent chatbots is a research field full of challenges and opportunities. In the future, with the continuous development and application of artificial intelligence and chatbot technology, the anthropomorphic digital avatar of intelligent chatbots is expected to bring more intelligent, efficient, and humanized services and experiences to human society.

Although the research of chatbot anthropomorphism has made some progress, there are still some problems and challenges. First, in practical applications, users may have different acceptance and preferences for the degree and manner of anthropomorphic chatbots, so a lot of user research and experiments are needed to evaluate and optimize the anthropomorphic features of chatbots. Secondly, whether the anthropomorphic features of chatbots can really improve the user experience and satisfaction needs to be scientifically evaluated and verified, for example, how to balance the anthropomorphic degree of the chatbot, how to balance the anthropomorphic degree of the chatbot and the chatbot itself. The relationship between the characteristics, avoiding the anthropomorphic features of the chatbot from being too prominent, affecting the user's cognition and

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experience of the chatbot 's functions; finally, how to optimize and personalize the anthropomorphic visual image of the digital avatar according to the user's feedback and behavior habits , to further improve user experience and satisfaction.

In conclusion, the anthropomorphization of the visual image of digital avatars of intelligent chatbots is a research field full of challenges and opportunities. But in the future, with the continuous development and application of artificial intelligence and chatbot technology, the anthropomorphic visual image of the digital avatar of intelligent chabots is expected to bring more intelligent, efficient, and humanized services and experiences to human society.

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ХИНЕВИЧ Р., МА Н.
ДОСЛІДЖЕННЯ АНТРОПОМОРФНОГО ВІЗУАЛЬНОГО ОБРАЗУ ЦИФРОВОГО АВАТАРУ РОЗУМНОГО ЧАТ-БОТУ

Проаналізовано антропоморфний дизайн інтелектуальних чат-ботів у контексті спілкування та взаємодії з користувачами-людьми. Визначено необхідність вивчення методів впровадження, принципів дизайну та методів оцінки антропоморфного дизайну цифрового аватара інтелектуальних чат-ботів, а також етапів проектування та розробки продукту.

Ключові слова: дизайн, чат-бот, антропоморфний, цифрове зображення, взаємодія людини і робота.