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Application of Behavior Recognition Technology Based on Deep Learning in Elderly Care

Shihui Zhang, HeBei North University, China
Jing Mi, HeBei North University, China*
Naidi Liu, HeBei North University, China

ABSTRACT

China is currently one of the countries with the largest elderly population in the world, and the issue of population aging has become a widespread concern. The behavior recognition algorithm based on deep learning is currently the main behavior recognition algorithm and one of the basic technologies in the field of computer vision. In existing research, the method of constructing complex classification models based on manual feature representation can no longer meet the requirements of high recognition accuracy and applicability, and the introduction of deep learning has brought new development directions for behavior recognition. Therefore, this article aims to study how to apply deep learning-based behavior recognition technology more accurately and effectively in the care of elderly people in the context of "artificial intelligence."

KEYWORDS

Aged Care Services, Behavioral Recognition Technology, Deep Learning

1 INTRODUCTION

China is transitioning towards an aging society, and unlike other countries, its per capita income is lower, resulting in a lower level of social security (Chang et al., 2022). Since China is the country with the largest population in the world, the scale of population development is also the largest. Data shows that in 2010, the proportion of elderly people aged 60 or older in China accounted for 13.26% of the total population, which rose to 18.7% in the latest census. Due to uneven development across the country, some provinces have even entered a stage of deep aging. Moreover, the population of the country has exceeded 1.4 billion, and the number of elderly people even exceeds the total population of many countries (Qiu et al., 2022).

As of the end of 2018, the population aged 65 and above in China had reached 166.58 million, accounting for approximately 11.94% of the total population in China, a year-on-year increase of

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0.6% (Cheng et al., 2023). In 2017, though China's population decreased by 2 million, the birth rate still exceeded 19.4%. The population statistics and predictions for Chinese population aged 65 and above from 2000 to 2035 are shown in Figure 1.

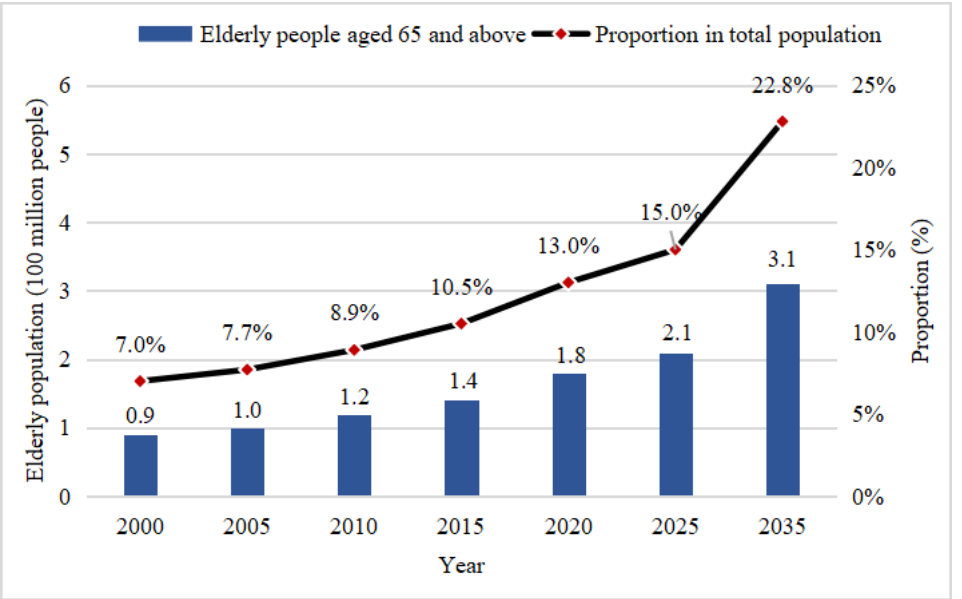
At present, the natural and social structure of the Chinese people is rapidly changing. In the next 50 years, the size of China's elderly population will sharply increase. It is expected that by 2025, the elderly population aged 60 and above in China will reach 318 million, with the proportion of the elderly population accounting for 21% of the national population. At the same time, as the capacity of family caregivers gradually decreases, there will be a large number of long-term care needs, which will have a huge impact on China's economic growth and pose challenges to the national social security system.

Nowadays, there are still many problems in elderly care in China, such as cost burden, multiple elderly problems, declining medical costs, and a lack of professional service systems for the elderly. Determining how to build a healthy aging society has become a major social problem that China urgently needs to solve. The market size of China's elderly care industry is shown in Figure 2.

According to the "*China Elderly Care Development Report (2020),*" in 2019, the number of elderly care institutions in China reached 68000, with 71000 beds. However, the number of both elderly care institutions and beds is still far from meeting the needs of the elderly. It can be foreseen that the market size of China's elderly care industry will continue to grow in the future and will drive the development of related industry chains, such as health products, medical devices, medical services, etc. Meanwhile, with the development of technology and policy support, the service quality and level of the elderly care industry will continue to improve.

It is not uncommon for an elderly person's daily life to be filled with a variety of unexpected incidents. Accidents, like falls and heart attacks, can pose a threat to safety and could even result in death if no one is there to provide emergency care and treatment in a timely manner. As a result, prompt detection of any abnormal situations in the elderly can enhance both the industry's service quality and the safety and security of their everyday life (Karthickkumar & Kumar, 2020). The behavior recognition technology uses algorithms to extract similar and different features between behaviors from the collected human target images (including RGB images, grayscale images, infrared images, RGB-D depth images, etc.), and uses features to classify (Ozcan & Basturk, 2020). Due to

Figure 1. Population statistics and projections of Chinese Population aged 65 and above from 2000 to 2035



A Reconfigurable Supporting Connected Health Environment for People with Chronic Diseases

Abbes Amira, Naeem Ramzan, Christos Grecos, Qi Wang, Pablo Casaseca-de-la-Higuera, Zeeshan Pervez, Xinheng Wangand Chunbo Luo (2015). *Healthcare Informatics and Analytics: Emerging Issues and Trends (pp. 332-352).*
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