Chapter 12
Enhancing Elderly Care Through Computational Intelligence and Internet of Everything:
Innovations and Impacts

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ABSTRACT

The aging global population presents significant challenges for healthcare systems, requiring innovative approaches to improve elderly care. This chapter examines the transformative potential of the Internet of Everything (IoE) and Computational Intelligence (CI) technologies in revolutionizing care for the elderly. IoE, by integrating interconnected devices, data analytics, and artificial intelligence, enables real-time health monitoring, personalized care, and enhanced quality of life. Key applications discussed include remote health monitoring, smart homes, wearable devices, and assistive robotics, which allow elderly individuals to maintain independence while ensuring safety and well-being. The chapter also explores ethical considerations,

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privacy issues, and technical challenges related to IoE in healthcare. By analyzing current trends and future prospects, the chapter provides insights into how IoE and CI can improve elderly care efficiency and effectiveness, leading to better health outcomes and enriched lives for the aging population.

1. INTRODUCTION

The global demographic landscape is undergoing a profound transformation due to the rapid aging of populations worldwide. By 2050, the number of people aged 65 and older is projected to reach 1.5 billion, representing a growing proportion of society that will require specialized healthcare and social services (United Nations, 2022). With aging comes a myriad of health concerns, including chronic diseases, mobility impairments, cognitive decline, and increased dependence on caregivers. These challenges place significant pressure on healthcare systems and underline the need for innovative solutions that can scale efficiently while improving care quality.

The integration of Computational Intelligence (CI) and the Internet of Everything (IoE) holds enormous potential in addressing these challenges. Computational intelligence, encompassing technologies like artificial intelligence (AI), machine learning (ML), and advanced data analytics, provides the tools necessary to automate and optimize healthcare processes. IoE, with its capability to connect devices, systems, and individuals through a vast network, ensures that healthcare becomes increasingly interconnected and responsive. Together, CI and IoE represent a paradigm shift in how elderly care can be managed, monitored, and enhanced, promoting more proactive, personalized, and cost-effective solutions.

2. INNOVATIONS IN ELDERLY CARE THROUGH CI AND IOE

2.1 Health Monitoring and Predictive Analytics

One of the most significant contributions of CI and IoE in elderly care is the real-time monitoring of health conditions through connected devices, including wearable sensors, smart home technologies, and mobile health applications. These devices collect data on vital signs, sleep patterns, mobility, and even emotional states. Using AI algorithms, this data can be processed to predict potential health risks, such as falls, heart attacks, or the onset of chronic conditions like diabetes or hypertension (Mei et al., 2023). Predictive analytics allows for early interventions, reducing hospitalizations and improving outcomes.