Chapter 6
Recent Trends in Soft Robotics for Assistive Technologies

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ABSTRACT

Wearable healthcare devices have transformed personal health management through continuous monitoring. Soft robotics, with its emphasis on compliant and adaptable systems, offers a new paradigm for human-machine interaction. This emerging field holds immense potential for developing wearable devices that seamlessly integrate with the human body. By employing soft robotic technologies, we can create innovative tools for assessing physical ergonomics and informing lifestyle and medical interventions. This integration of soft robotics with wearable health monitoring promises to revolutionize preventive healthcare and personalized medicine. This work provides a comprehensive overview of healthcare applications for aging population and mobility impaired. By examining various techniques, we aim to establish a solid

DOI: 10.4018/979-8-3693-6308-9.ch006

foundation for understanding the current landscape of this field.

1. INTRODUCTION

Assistive technology promotes inclusion, participation, and independence for individuals with disabilities and ageing populations. It allows individuals to maintain or improve their functioning, enhancing their quality of life and empowering them to join in education, professional and social life. They can enhance user engagement, streamline procurement and stock management, and boost service efficiency and coverage—assistive technology. Assistive technology support individuals with disabilities or restricted mobility functions. In this context, 'soft robotics' refers to a field of robotics that focuses on the development of robots with compliant and flexible materials, allowing for safe and gentle interaction with humans. Assistive technology for visual impairments is well recognised. A low-cost Braille display device for visually impaired individuals was developed with accuracy and high refresh frequency with a virtual touch-reading system (Chen et al., 2024). Medical and assistive health technology is crucial in promoting universal access to meet the needs of ageing populations (Borg & Shae, 2024).

Figure 1. Soft robotics technology