Chapter 2
Ethical Considerations in Human-Centered AI Design for Assistive Technologies

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ABSTRACT

As the technology evolved with the leading role of Artificial Intelligence (AI) in developing assistive technology, is constantly enabling people to live a quality life. However, bridging the connection to enable human with disabilities, which is promising direction towards their independence and autonomy, comes at the cost of the ethical implications. This chapter discusses the pivotal role of Human Centered AI (HCAI) in relation to assistive technology. We explore the principles of HCAI in this chapter to propose a framework to be utilized while developing assistive tech-

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nology systems. The chapter collectively focuses on guiding the researcher, industry practitioners, and policymakers to comply with ethical concerns and ensure that assistive AI is a source of empowerment, transparency, security, and trustworthiness.

INTRODUCTION

Artificial Intelligence (AI) has played a pivotal role in defining human interaction with their surrounding shaped by the usage of computational tools leading to a rapid transformation. The abilities of AI have an impactful transformation in the field of assistive technologies empowering the individuals with physical, sensory, or cognitive impairments (de Freitas et al., 2022). AI is trending by reshaping the lifestyle of individuals earlier with limited mobility by enabling them to live with independence and dignity (Belkacem et al., 2020). Incorporating technology in the development of systems has led to applications consisting of providing support similar to the real-world settings. Intelligent prosthetics, autonomous wheelchairs, speech synthesizers, computer interfacing with brain, are few examples in the list which is becoming non-exhaustive. As human kind is advancing and AI systems have become intertwined in our everyday life, we also face the perils of technology posing significant ethical challenges. With the emphasis is on the support of AI design for autonomous systems (Subías-Beltrán et al., 2025), researchers and communities are also concerned about a human centered approach, which incorporates empathy, inclusivity, and moral responsibility (Taylor et al., 2024).

These concern have shaped into the emerging field of Human Centered AI (HCAI), where the emphasis is on the development of intelligent systems with the core value of trustworthiness, transparency (Han et al., 2022). While AI's inclination is towards developing efficient systems with accuracy, HCAI stresses on the development of the system, which can empathize with humans by understanding their emotions.

On the other hand, HCAI reframes success as promoting human capabilities and assuring safety and inclusion. The element of success is important in assistive settings in order to engage vulnerable and underprivileged people (Umucu et al., 2025). These users tend to feel comfortable with the sense of autonomy by decision-making power. Any design, which requires input information such as predictive algorithm or intervention by an agent, will cause jeopardizing their sense of autonomy (Shin, 2025). This chapter articulates on ethical challenges posed by the advent of AI technologies and resolution through integration of HCI to achieve a responsible design encompassing the humanistic needs.

Fuzzy Ontology Based Activity Recognition for Assistive Health Care Using Smart Home

K.S. Gayathri, K.S. Easwarakumarand Susan Elias (2020). *International Journal of Intelligent Information Technologies (pp. 17-31).*
www.irma-international.org/article/fuzzy-ontology-based-activity-recognition-for-assistive-health-care-using-smart-home/243368