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User acceptance and trust in AI technologies: Factors influencing healthcare professionals' and patients' trust in AI tools

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Abstract
Artificial Intelligence (AI) is quickly changing a lot of industries, such security, virtual assistance, and healthcare. AI and human-computer interaction coming together (HCI) has stimulated user engagement by resulting in the creation of interactive intelligent systems. This study provides an in-depth analysis of the convergence of AI and HCI, emphasizing user viewpoints and difficulties in the healthcare setting.

Keywords: Artificial intelligence, healthcare, user perspectives, human-computer interaction

Introduction
Artificial intelligence (AI) is a relatively new technology that is well-liked in industries including security, healthcare, and virtual assistance. Human-Computer Interaction (HCI) and artificial intelligence (AI) combine to provide interactive intelligent systems that use a variety of algorithms and HCI to give transparency. Examining the relationship between AI and HCI, with a focus on Explainable Artificial Intelligence (XAI) in healthcare, is the goal of this article.

Background and Context
The evolving field of human-AI collaboration in healthcare offers significant potential to alleviate workforce shortages and enhance the quality of care provided to patients (Lai, 2021) [24]. As healthcare systems face increasing demands, AI technologies can assist in streamlining processes, improving diagnostic accuracy, and optimizing treatment plans. However, the integration of AI into clinical practice is not without its challenges. Issues such as biases in decision-making, which can adversely affect patient outcomes, remain a critical concern.

Moreover, the successful adoption of AI technologies hinges on overcoming trust issues among healthcare professionals and patients alike. Trust is essential for fostering collaboration between humans and AI, as it directly influences the willingness to rely on AI recommendations in clinical decision-making. The transition from AI development to real-world implementation also necessitates a focus on end-user engagement and socio-technical considerations. This includes understanding the workflows of healthcare providers and the needs of patients to ensure that AI tools are designed effectively (Andersen, 2021) [13].

Furthermore, the importance of trust and transparency in AI systems cannot be overstated. Human-centred perspectives are vital in creating AI solutions that align with clinical realities and ethical standards (Hemmer, 2022) [14, 32]. By emphasizing these principles, stakeholders can work towards a more successful integration of AI in healthcare, ultimately leading to improved patient care and operational efficiency.

Brief Overview of the Increasing Role of AI in Healthcare
The role of AI in healthcare is rapidly expanding, encompassing areas such as medical imaging, diagnostics, patient engagement, drug discovery, and administrative tasks (Kuwaiti,

2023) [1]. Significant applications of AI include providing diagnosis and treatment recommendations, enhancing patient engagement, and streamlining administrative processes (Davenport, 2019) [6]. The integration of AI is further bolstered by the growing availability of healthcare data and advancements in analytical techniques. However, challenges remain, particularly in the realms of technical, ethical, and social issues (Kuwaiti, 2023) [1].

Importance of Understanding the Collaboration between Humans and AI in Healthcare Settings

The collaboration between humans and AI in healthcare holds immense potential for improving outcomes, yet it is shaped by a variety of technical, human-centred, and socio-technical considerations (Hemmer, 2022) [14, 32]. Key challenges in this collaboration involve work types, labour relations, and broader social impacts. Several factors influence the interactions between medical professionals and AI, including the quality of training data, system performance, explainability, adaptability, and the critical element of trust (Knop, 2022) [21]. Understanding these dynamics is essential for maximizing the benefits of AI while addressing the challenges that accompany its integration into healthcare settings.

Research Methodologies

A methodical approach was used to thoroughly review the Human-AI Collaboration in Health-care. We used snowballing strategies, consulted specialized resources, and searched scholarly databases. Peer-reviewed publications and reliable sources were prioritized in order to guarantee that the study was grounded in a wide range of literature.

User Perspectives in Human-AI Collaboration

Research emphasizes the critical role of AI-to-human communication in co-creative systems, highlighting how effective communication can enhance collaboration (Rezwana, 2023) [30]. Transparency in AI design is particularly important, as studies indicate that human participants often perceive human partners more favorably than AI partners (Ashktorab, 2021) [4]. The challenges inherent in designing collaborative human-AI systems are addressed through the concept of "leaky abstractions," which underscores the complexities and potential misunderstandings in these interactions (Subramonyam, 2022) [25].

Moreover, a shift from traditional human-human collaboration to human-AI collaboration is proposed, focusing on the necessity of mutual understanding of goals and the importance of shared progress tracking to facilitate effective teamwork (Wang, 2019) [35]. This approach not only enhances the collaboration process but also helps bridge the gap between human and AI contributions in various healthcare settings. Perspectives on healthcare professionalism increasingly emphasize the importance of incorporating patient input, aligning global curricula, and enhancing overall professionalism within the field (Grainger, 2011) [12]. Patient perspectives on AI in healthcare indicate a general receptivity to these technologies; however, there are significant concerns regarding privacy, trust, and transparency (Khullar, 2022; Esmaeilzadeh, 2021; McCradden, 2020) [20, 9, 27].

Furthermore, interdisciplinary collaboration is essential, underscoring the need for a patient-centered approach and robust ethical frameworks to guide the integration of AI in healthcare settings. By prioritizing these elements, the healthcare community can better address both professional standards and patient concerns, ultimately leading to improved outcomes for all stakeholders.

Applications of AI in Healthcare

AI applications in healthcare include Clinical Decision Support Systems, Diagnostic Imaging and Pathology, and Electronic Health Records. User experiences, successful case studies, and insights into the usability and effectiveness of AI-driven technologies are explored.

Challenges in Human-AI Collaboration

Human-AI collaboration faces several significant challenges, including biases, trust issues, and barriers to adoption (Lai, 2021) [24]. For AI systems to function effectively alongside humans, attributes such as transparency, explainability, and reliability are essential (Endsley, 2022) [8]. Moreover, the responsible development and implementation of AI in healthcare necessitate interdisciplinary research and collaboration to ensure that diverse perspectives and expertise are integrated into the process (Matheny, 2019; Endsley, 2022) [8]. Addressing these challenges is crucial for fostering effective human-AI partnerships that enhance healthcare delivery.

Trust and Reliability

Trust and reliability are crucial for AI & successful implementation in healthcare. Factors influencing user trust include transparency, explainability, accountability, risk perception, facilitating conditions, and social influence (Wang, 2023; Asan, 2020) [34, 3]. Reliable performance is essential for building and maintaining user trust.

Future Directions and Recommendations

The future of AI in healthcare is promising, presenting numerous opportunities for advancements in disease diagnosis, treatment, and patient care. Key focus areas for future development include real- world evaluation, the establishment of robust regulatory systems, the integration of the Internet of Things (IoT), and fostering effective AI collaboration. It is essential to address technical, ethical, and practical considerations to ensure the responsible development and implementation of AI technologies in healthcare.

Conclusion

Human-AI collaboration in healthcare presents significant potential for enhancing patient outcomes, yet it also faces challenges such as biases, trust issues, and barriers to adoption. A human-centred approach, coupled with transparency and interdisciplinary collaboration, is vital for the successful integration of AI into clinical practice. This paper offers comprehensive insights into the intersection of AI and human-computer interaction (HCI) in healthcare, underscoring the necessity for responsible AI development and on-going research to navigate these complexities effectively.

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