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Challenges and Prospects of Deploying AI and Machine Learning for Clinical Diagnosis
in African Healthcare

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Abstract



The integration of artificial intelligence (AI), machine learning, and robotics into clinical diagnosis has become prevalent. AI made its first appearance in healthcare in the 1970s when used in diagnosing and treating ailments such as glaucoma and infectious diseases through Bayesian methods. Nevertheless, the second decade of the current century witnessed an expansive adoption of machine learning techniques, leading to AI's heightened prominence in healthcare. Machine learning-driven image recognition has demonstrated remarkable efficacy, prompting clinicians to rely increasingly on these technologies for somewhat precise medical diagnoses and prognoses.

Although these advancements have shown their relevance and effectiveness in medically advanced regions of the Global North and selected areas in the Global South, the question arises as to their viability within the healthcare landscape of Africa, given contextual variations. This paper delves into the potential efficiency of deploying these technologies within African healthcare, aiming to address these contextual concerns. This paper presents a pessimistic standpoint, suggesting that the deployment of these technologies might inadvertently introduce biases and discrimination against Africans. This stems from the inherent nature of the data used to develop these technologies, primarily sourced from healthcare experiences in designing nations, coupled with the pervasive algorithmic biases prevalent in contemporary machine learning systems.

In response to this challenge, the paper advocates for a paradigm shift in AI development. It proposes that African nations proactively engage in the creation of healthcare AI technologies that are attuned to distinct African conditions, prevalent medical conditions, and prognostic methodologies. Key prerequisites include the establishment of robust infrastructure for efficient data collection and storage of electronic healthcare records, capturing the intricacies of day-to-day healthcare encounters across the African continent. In essence, this paper underscores the importance of contextual sensitivity in the application of AI and machine learning within African healthcare.

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