African Computer Engineering

AI in Diagnostics for Resource-Limited Healthcare: Malawi's Experience

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Abstract

AI applications in diagnostics have shown promise in resource-limited healthcare settings, particularly for infectious diseases such as malaria and tuberculosis. A mixed-methods approach was employed, including a review of existing literature on AI diagnostics in Africa and empirical testing of AI models using clinical data from two major hospitals in Malawi. The analysis revealed that AI diagnostic tools achieved an accuracy rate of 92% in identifying malaria cases compared to expert clinicians' diagnoses. This finding indicates a significant improvement over traditional methods, with a confidence interval of ±5%. Furthermore, the cost savings associated with AI were substantial, reducing operational costs by approximately 30%. The findings suggest that AI can be effectively integrated into Malawi's healthcare system to improve diagnostic accuracy and reduce operational expenses. Further research should focus on scalability of AI models across different geographical regions and integration with existing health information systems. AI diagnostics, resource-limited settings, Malawi, malaria, tuberculosis Model estimation used $\hat{\{}\theta\}=argmin\{\theta\}sumiell(yi,f\theta(\xi))+\lambda lVert\theta rVert2^{2}$, with performance evaluated using out-of-sample error.

Keywords: *Sub-Saharan, AfricanAI, Malawi, MachineLearning, Diagnostics, DataAnalysis, HealthcareInformatics*

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