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Design and Development of an Artificial Intelligence - Enabled Predictive Healthcare System

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Abstract: *The rapid expansion of healthcare data generated through electronic health records, medical imaging systems, laboratory reports, and wearable devices has created significant opportunities for intelligent data-driven healthcare solutions. Traditional healthcare systems primarily follow a reactive approach, where diseases are diagnosed and treated only after the onset of symptoms, often resulting in delayed intervention, increased treatment costs, and higher mortality rates. To address these limitations, this paper presents the design and development of an Artificial Intelligence–enabled predictive healthcare system aimed at early disease detection and proactive clinical decision support.*

Experimental evaluation demonstrates that the AI- driven predictive models provide improved prediction accuracy and effective risk stratification, enabling healthcare professionals to take preventive measures and personalize treatment plans. The proposed system highlights the potential of Artificial Intelligence to transform healthcare from a reactive to a predictive and preventive paradigm while addressing challenges related to data quality, privacy, and interpretability. This work contributes toward the development of intelligent healthcare systems that enhance patient outcomes, optimize medical resources, and support informed clinical decision-making.

Keywords*:* Artificial Intelligence, Predictive Healthcare, Machine Learning, Deep Learning, Disease Prediction, Clinical Decision Support, Health Risk Assessment

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