Design and Implementation of AI-Driven Predictive Analytics Models

Miss. Gita Balasaheb Nawale

Department of Mathematics

Sahyadri Bahujan Vidya Prasarak Samajs Sahakar Maharshi

Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner, Ahmednagar

Abstract: *Artificial Intelligence (AI) and Machine Learning (ML) have emerged as transformative technologies that enable systems to learn from data, recognize patterns, and make intelligent decisions with minimal human intervention. This study presents the design and development of an AI-driven predictive analytics framework capable of processing large-scale datasets and generating accurate, data-informed insights. The proposed system integrates data preprocessing techniques, feature extraction methods, and multiple machine learning algorithms to build reliable predictive models suitable for real-world applications.*

The framework emphasizes model optimization, performance evaluation, and scalability to ensure consistent accuracy and robustness. Evaluation metrics such as accuracy, precision, recall, F1-score, and error measurements are used to validate system performance. The developed model demonstrates the ability to improve decision-making efficiency, reduce uncertainty, and support automation across domains such as healthcare, finance, education, agriculture, and business intelligence.

By combining advanced learning algorithms with structured data processing techniques, the proposed system provides an adaptable and efficient solution for intelligent forecasting and analytical tasks. The study highlights the growing significance of AI and ML in solving complex computational problems and enabling data-driven innovation..

Keywords: Artificial Intelligence, Machine Learning, Predictive Analytics, Data Mining, Deep Learning, Supervised Learning, Model Optimization, Intelligent Systems, Data-Driven Decision Making, Pattern Recognition