

A HYBRID RANDOM FOREST AND SVM FRAMEWORK FOR INTELLIGENT CROP SELECTION USING SOIL HEALTH AND ENVIRONMENTAL FACTORS

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Accurate crop selection based on soil health and environmental conditions is vital for improving agricultural productivity and enabling precision farming. Traditional recommendation methods rely on fixed rules and empirical knowledge, limiting adaptability to changing agro-climatic conditions. This study proposes a machine learning–based crop recommendation framework using soil nutrients (N, P, K) and environmental parameters such as temperature, humidity, pH, and rainfall. Standard classifiers including KNN, SVM, RF, and MLP are evaluated under a unified experimental setup. A hybrid RF–SVM model is also developed to enhance prediction reliability. Experimental results on a benchmark dataset show that the hybrid model outperforms individual classifiers, demonstrating the effectiveness of hybrid learning for data-driven crop recommendations.
