Machine Learning: Applications in Agriculture (Crop Yield Prediction, Diease and Pest Detection)

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Abstract: *In-depth analysis of machine learning (ML) applications in agriculture is provided in this research study. In addition to agricultural production prediction, disease detection, soil analysis, irrigation control, and automation of farm equipment are some of the areas in which machine learning (ML) approaches are explored. The revolutionary potential of ML in solving agricultural problems is highlighted in the paper. Additionally, it addresses issues with model interpretability, scalability, and ethical implications. ML can contribute to efficient and sustainable agricultural practices that can satisfy the demands of a growing population by increasing acceptance and effectiveness. Crop yield prediction plays an important role in agricultural planning, resource management, and food security. Traditional yield estimation methods rely on historical data, expertise, and manual calculations, and are often slow and inaccurate. Advances in machine learning algorithms and the availability of abundant data have led researchers to focus on developing predictive models that can accurately predict crop yields. As global food demand increases, ensuring crop health and productivity is critical. Diseases and pests pose major challenges to agriculture, leading to large yield losses and economic consequences. Early detection and timely intervention are essential for effective disease and pest control. In recent years, machine learning techniques have shown great potential to revolutionize the agricultural sector by providing accurate and efficient detection methods*

Keywords: Agriculture, Machine Learning, Applications, Predictions, Crop Yield, Disease and pest

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