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Smart Detection of Fruit Diseases & Fertlizer Recommendation Using CNN

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Abstract: *Agricultural productivity is critically affected by fruit diseases, especially when detection and treatment are delayed. Traditional diagnosis methods are manual, time-consuming, and often inaccessible to small-scale farmers. This research presents a Smart Fruit Disease Detection and Fertilizer Recommendation System that leverages Convolutional Neural Networks (CNNs) for image-based disease classification, integrated with a rule-based fertilizer recommendation engine. The system features a web-based interface where users can upload fruit images—specifically apples and pomegranates—for analysis. Upon disease detection, the system provides tailored fertilizer suggestions, enhancing precision agriculture practices. Experimental evaluation on curated datasets yielded high classification accuracy (~91% for apples, ~88% for pomegranates) and rapid inference times, demonstrating the system's viability for real-world agricultural deployment. This dual-purpose solution bridges a critical gap by combining AI-powered diagnostics with actionable recommendations, empowering farmers and contributing to smart, sustainable farming*

Keywords: Fruit disease detection, Convolutional Neural Networks (CNN), image classification, fertilizer recommendation, smart agriculture, web-based application, precision farming, deep learning, apple, pomegranate

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