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(57) Abstract :

The invention provides a dual-model framework integrating an image acquisition and pre-processing module that captures and augments crop images via a mobile camera or upload interface, with a convolutional neural network module employing convolution layers, pooling layers and fully connected layers to classify images as diseased or healthy. The system further incorporates a linear regression module that receives real-time weather parameters and historical crop metrics to estimate disease severity using least squares estimation. A generative AI report generation unit synthesizes outputs into a digital diagnostic report displayed on a user interface module. Complementary modules include a data collection and integration module and a model training and storage unit to periodically update the analysis, thereby facilitating real-time crop disease diagnosis and severity assessment.

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