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(57) Abstract :

The invention relates to an adaptive AI-based system for polyhouse agriculture that integrates a Data Acquisition Unit for gathering real-time sensor data on temperature, humidity, soil moisture, light intensity, and CO₂ levels, along with external weather data, with an AI Processing Core comprising a Climate Variability Module for forecasting microclimate changes, a Crop Selection Engine employing machine learning for tailored crop recommendations, a Resource Optimization Simulator for modeling water, fertilizer, and energy consumption, and an Adaptive Learning Module for real-time system updates based on operational feedback. An Output Advisory Module and a User Interface Module with offline-first, multilingual, and voice-assisted capabilities further enhance the system, which continuously generates integrated, real-time, and predictive crop management advisories for optimized resource utilization in polyhouse environments.

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