Abstract

A greenhouse is a controlled environment designed to grow plants under optimal conditions, where light intensity is essential for photosynthesis. Plants grown outside the greenhouse often face the risk of disease and unsatisfactory yields. In previous plantings, 30% of hydroponic pakcoy plants in the greenhouse did not grow to a uniform leaf length and weight. The placement of hydroponic pakcoy in the greenhouse aims to facilitate the control of conditions and monitoring. This research develops an IoT-based pH monitoring and lighting management system with fuzzy algorithms to increase the yield of hydroponic pakcoy. The system uses pH and light sensors connected to a microcontroller to automate lighting settings based on the detected light intensity. Fuzzy algorithms are used to analyze sensor data and make optimal decisions regarding lighting and pH adjustment. The results show that this IoT system is effective in monitoring and controlling light intensity and pH in greenhouses. This technology improves monitoring efficiency and accuracy, making it easier for farmers to manage greenhouse conditions for optimal plant growth.