AI-Driven Smart Lawn Care Platform for Health Diagnosis and Predictive Maintenance of IoT-Connected Lawn Equipment

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ABSTRACT

Lawn maintenance remains a challenge for many homeowners, particularly those lacking professional horticultural knowledge, often resulting in inconsistent care quality and increased cognitive load. Traditional approaches rely heavily on manual inspection, fragmented tools, and multiple service platforms, making the process time-consuming and inefficient. Greenhub, an AI and IoT integrated lawn care platform, addresses these limitations by unifying diagnosis, task scheduling, and equipment management into a single streamlined system. Combining AI-powered image analysis with connected lawn care devices, Greenhub automatically detects lawn health issues such as diseases, weeds, and localized damage while providing actionable, context-aware solutions. Its core features, including an onboarding questionnaire, AI lawn analysis, AI assistant chat with photo upload, and AI-driven task scheduling, deliver personalized care plans and reduce user decision-making effort. Greenhub integrates AI analysis, visualization, and IoT into an all-in-one horticultural platform, reducing misinformation, clarifying source reliability, and lowering dependence on costly professionals.

KEYWORDS

Smart Lawn care, AI-driven diagnosis, Predictive maintenance, IoT, Lawn health monitoring, Robotics

1. Introduction

Maintaining a healthy lawn requires accurate diagnosis, timely intervention, and efficient management of tools and resources. However, traditional lawn care remains fragmented: homeowners often depend on limited personal knowledge, manual inspections, and disconnected tools or services, resulting in inefficiency, inconsistent quality, and high cognitive load. The motivation for this study arises from social observations: neighbors often borrow gardening tools due to limited resources, and users on platforms such as Red Note or Instagram frequently share plant photos seeking advice, yet the responses are conflicting and unreliable. These situations reveal the fragmented nature of current lawn care practices and highlight the necessity of developing a more reliable and integrated solution.

Recent advances in Artificial Intelligence (AI) and the Internet of Things (IoT) provide opportunities to address these pain points. AI-powered visual diagnostics can identify weeds,

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diseases, and lawn damage with near-expert accuracy, while IoT-enabled devices such as robotic mowers and environmental sensors offer automated task execution. Yet, existing solutions remain siloed, lacking personalization, reliable knowledge validation, and unified management.

This study introduces *Greenhub*, an AI- and IoT-driven lawn care platform that centralizes diagnosis, scheduling, and tool control into a single system. The platform integrates image-based diagnostics, data visualization, and personalized task planning to reduce misinformation, validate source reliability, and minimize reliance on costly professionals. Our contributions are fourfold: (1) development of Greenhub as an all-in-one platform, (2) validation of AI diagnostics against expert assessments, (3) a prototype-based user study evaluating usability and perceived value, and (4) a discussion of limitations and future directions. The remainder of this paper is organized as follows: Section 2 outlines research challenges, Section 3 presents the Greenhub platform, Section 4 details experimental design, Section 5 reports results, Section 6 discusses findings, and Section 7 concludes.

2. RELATED WORKAND LITERATURE REVIEW

Artificial Intelligence (AI) and Internet of Things (IoT) technologies have been widely explored in domains such as smart homes, precision agriculture, and urban green infrastructure. AI-based visual diagnostics have shown near-expert performance in plant disease and weed detection [3,7], while IoT devices such as robotic mowers, irrigation systems, and soil sensors support automated task execution and environmental monitoring [6,8]. In turfgrass research, studies have addressed robotic mowing technology [6], turfgrass selection for water efficiency [14], and the ecological impact of pesticides and lawn care practices [5,9]. However, these works typically focus on isolated technical aspects and lack holistic solutions that integrate diagnosis, decision support, and equipment management into a unified platform.

In the smart home domain, platforms such as Alexa and Google Home serve as centralized dashboards for controlling thermostats, fans, vacuum cleaners, and humidifiers. While they improve convenience, decision-making is still left to the user, whose capacity for daily micro-decisions is inherently limited. Similarly, lawn-related IoT devices, including camera-equipped weeding robots, soil probes capable of uploading environmental data, and mobile-controlled irrigation systems, offer valuable but fragmented functionalities. The absence of integration across these devices and services highlights a gap in current research and practice. This study addresses that gap by introducing *Greenhub*, an AI- and IoT-driven lawn care platform that combines image-based diagnostics, data visualization, and tool coordination, moving beyond control dashboards toward more intelligent, automated, and user-centered lawn management.

3. RESEARCH CHALLENGE

Although existing lawn care solutions have achieved certain technical progress in individual aspects, several key pain points remain in actual user management processes. These challenges represent the entry points for the four core features and AI image diagnostic technology proposed in this study:

3.1. Insufficient Personalization and Accurate Matching of Care Needs

Lawn sizes, available time, and maintenance philosophies (e.g., reducing chemical usage, preserving biodiversity) vary significantly between users [2]. Existing systems often lack a thorough understanding of users' initial conditions, resulting in generic and less targeted recommendations [1].

3.2. Difficulty in Accurately Diagnosing Lawn Health

Many users lack professional gardening knowledge and may struggle to identify and address issues such as diseases, weeds, or localized damage in time. Current diagnostic methods rely heavily on subjective user observation, which can be affected by limited experience or environmental conditions.

3.3. Lack of Immediacy and Interactivity in Problem-Solving

When changes in lawn conditions occur, users often need to search for information, contact experts, or wait for on-site services. This process is time-consuming, lacks instant feedback, and makes it hard to act at the optimal time.

3.4.Fragmentation in Tool and Task Management

Maintenance schedules for equipment like mowers or trimmers, task planning, and actual lawn conditions are often managed separately. Users must switch between multiple platforms or tracking methods, increasing both time and cognitive demands.

3.5.High Cognitive Load in Multitasking Environments

Users are required to switch and prioritize between diagnosis, task scheduling, and equipment maintenance repeatedly, which can lead to delays, duplicated work, and reduced care quality and efficiency.

4. DESIGN ARTIFACTS

Greenhub is an AI- and IoT-driven lawn care platform designed around four artifacts that cover the workflow from onboarding to task execution.

4.1. Interactive System

The system is designed to provide users with an intelligent platform that supports more efficient and reliable lawn care by integrating AI diagnostics and IoT management. Users can continue to operate their existing gardening devices—such as robotic mowers, irrigation systems, and soil sensors—through the Greenhub app, which centralizes all functions in one place. To begin, users complete an onboarding questionnaire that defines their lawn conditions, maintenance habits, and personal preferences. Unlike traditional fragmented approaches, the system automatically visualizes this data into personalized lawn and user profiles, eliminating the need for manual record-keeping.

Based on these profiles, Greenhub generates a Lawn Health Index (LHI) and continuously monitors conditions through uploaded images and sensor data. The system provides targeted recommendations and highlights tasks most relevant to the current season, weather, and lawn status. At the same time, users can access a dynamic task timeline that adjusts as conditions change, offering timely prompts such as mowing adjustments or equipment maintenance. On the homepage, users always see both their current lawn profile and upcoming priorities, helping them stay aware of the overall health of their lawn and make informed decisions at the right moment. Here is the user flow of this system.

4.2. Onboarding Questionnaire

Upon first use, Greenhub guides users through a concise onboarding questionnaire to input lawn size, daily maintenance habits, available time, environmental characteristics, and care preferences [2]. The system visualizes the data, transforming it into digestible lawn and user profiles that facilitate subsequent analysis and recommendation retrieval.

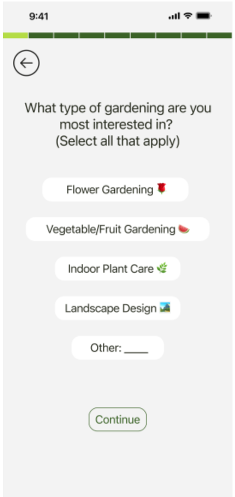

Figure 1. Greenhub Onboarding questionnaire interface

4.3. AI Lawn Analysis

By combining user-uploaded photos, mower camera images, and sensor data, the system identifies weeds, diseases, and damage, generating a Lawn Health Index (LHI) and offering treatment options with safety guidelines.

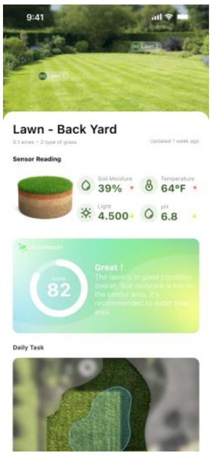

Figure 1. Greenhub AI-analysis interface

4.4. AI Assistant Chat with Photo Upload

Users can upload photos and chat with an AI assistant for real-time issue resolution. The assistant uses both current images and historical data to provide actionable, context-aware solutions.

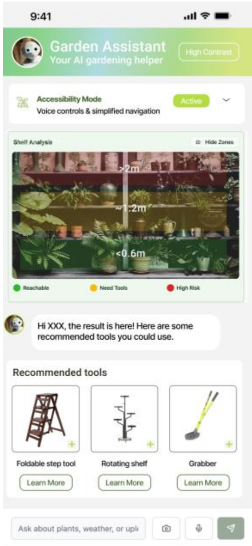

Figure 3. Greenhub AI assistant interface

4.5. Tool Management & AI Task Scheduling

Greenhub integrates connected devices and generates dynamic schedules based on lawn health, seasons, and weather. It provides reminders (e.g., blade replacement) and supports third-party device management.

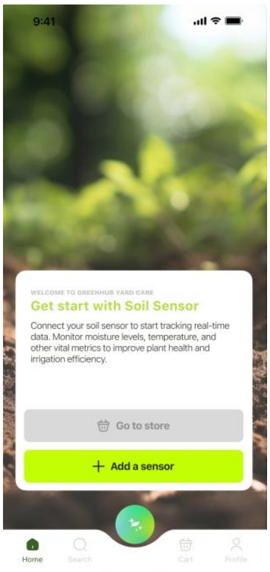

Figure 4. Greenhub tool and sensor management interface

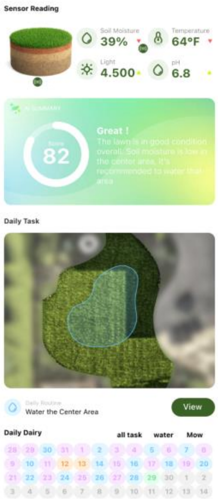

Figure 5. Greenhub task assignment interface

5. EXPERIMENTS

To evaluate the effectiveness and user value of the proposed AI-driven smart lawn care platform, we conducted two complementary experiments:

1. an **AI diagnostic accuracy study** comparing the platform's lawn issue recognition and Lawn Health Index (LHI) estimation against expert labels; and
2. a **prototype-based user study** assessing task completion, usability, and perceived value of the app's core features.

Together, these experiments examine both the technical reliability of the AI component and the practical benefits perceived by end-users.

5.1. Experiment 1: Validation of AI-Based Lawn Diagnosis

5.1.1. Objective

This experiment aimed to assess the extent to which the proposed AI module could produce lawn problem diagnoses and Lawn Health Index (LHI) scores that align with expert evaluations.

5.1.2. Data and Participants

Lawn condition data were collected from fifteen participants. Each participant was required to provide a set of tenlawn images captured under specific lighting conditions, including midday, evening, and nighttime. The images were taken from multiple perspectives, such as an overview shot, close-ups of weeds, healthy grass, and dry or damaged spots, to ensure accuracy and realism.

5.1.3. AI Model Training Data and Architecture

The AI model in this study was trained using a mix of data sources. In addition to public plant disease and turfgrass datasets in Wikipedia, we also collected lawn images shared by users on Reddit and Red Note, so the model could learn from real-world examples. In simple terms, the training process is similar to how ChatGPT is trained: we "fed" the model a large number of lawn-related photos and information until it gradually learned how to tell whether a lawn is healthy, where weeds or diseases might appear, and how to generate a Lawn Health Index (LHI).

5.1.4. Reference Standard

Two experienced lawn care professionals independently reviewed each image and assigned:

1. **Lawn problem categories**: weed infestation, disease, drought/stress, over-mowing, nutrient deficiency, and healthy condition (multiple categories could be selected); and
2. **Lawn Health Index (LHI)**: a composite score ranging from 0 (poor condition) to 100 (excellent condition), reflecting overall lawn quality.

In cases of disagreement, two additional experts conducted a joint evaluation and provided a third result, which served as the reference standard.

5.1.5. AI Output

The AI module processed each image to generate:

1. Predicted lawn problem categories (multi-label), and
2. A predicted LHI score (0–100) based on visual analysis.

5.1.6. Comparison Method

To evaluate AI performance, its outputs were systematically compared against the expert consensus (reference standard) using two complementary measures:

- **Category Agreement Rate (CAR):** the percentage of images for which the AI-predicted set of lawn problem categories exactly matched the consensus categories defined by experts.
- **Mean Absolute LHI Difference (MALD):** the average absolute difference between the Lawn Health Index (LHI) scores predicted by the AI and those established in the expert consensus.

These metrics together provide a comprehensive evaluation of AI accuracy, both in categorical classification and in quantitative scoring.

5.1.7. Success Criteria

The AI diagnosis was considered to achieve application-level reliability if the category agreement rate was **≥ 80%** and the mean absolute LHI difference was **≤ 8 points**.

5.2. Experiment 2: Prototype Evaluation of Core Platform Features

5.2.1. Objective

The second experiment aimed to assess user-perceived value and usability of four core features within the proposed Smart Lawn Care platform through a task-based prototype evaluation.

5.2.2. Participants

To maintain continuity of user context, fifteen participants from Experiment 1 were recruited for the prototype evaluation. All participants owned a lawn and possessed at least one lawn care tool, with varying levels of maintenance experience.

5.2.3. Prototype

A high-fidelity interactive prototype of the mobile application was developed, incorporating realistic interface flows, AI-driven feedback mock-ups, and simulated sensor data outputs.

5.2.4. Tasks and Feature Descriptions

Participants were introduced to four key features and completed corresponding tasks:

1. **Onboarding Questionnaire** – Participants provided lawn-related background information, including yard size, available weekly maintenance time, lawn health goals, and personal preferences such as chemical usage and biodiversity support.
2. **AI Lawn Analysis** – The AI presented an overall Lawn Health Index (LHI), highlighted damaged areas, identified weed locations, provided descriptions of weed species, and offered removal instructions. Recommendations were generated based on integrated sensor data (e.g., weather, temperature, soil conditions).
3. **AI Assistant Interaction** – Participants simulated real-world problem-solving by conversing with the AI assistant, including sending photographs of specific lawn issues for targeted advice.
4. **Tool Management and Task Scheduling** – Participants reviewed a unified dashboard of connected lawn care tools (robotic and manual), explored AI-recommended task schedules, and viewed maintenance reminders for each tool.

5.2.5. Procedure

Participants completed each task sequentially. Upon completing each task, participants assessed the feature’s perceived value on a 5-point Likert scale (1 = Not useful at all, 5 = Extremely useful).[15]Participants were encouraged to think aloud during interaction and to provide open-ended comments following each rating.

5.2.6. Data Analysis

Quantitative results were analyzed by calculating the mean and standard deviation of usefulness scores for each feature. Qualitative comments were thematically coded to identify recurring user needs, preferences, and potential improvement areas.

5.2.7. Success Criteria

A feature was considered to have demonstrated strong perceived value if its mean usefulness rating was **≥ 4.0** on the 5-point scale.

6. RESULTS

6.1. Experiment 1: Validation of AI-Based Lawn Diagnosis

The AI diagnosis module achieved a high level of agreement with expert consensus.

Across the 15 lawn data sets, the Category Agreement Rate (CAR) was 86.7% (13 out of 15 samples matched exactly, 95% CI: 62.1%–96.3%). The Mean Absolute LHI Difference (MALD) between AI and expert ratings was 6.4 points (SD = 2.9, 95% CI: 4.8–8.0).

To further examine the significance of the difference, a paired-sample t-test was conducted between AI-predicted and expert-assigned LHI scores. The results showed no significant mean difference ($t(14) = 1.21$, $p = 0.24$), suggesting that AI predictions are statistically consistent with expert evaluations.

Table 1. Comparison between AI and Expert LHI Scores

Sample	Ex LHI	AI LHI	Absolute Difference
1	78	80	2
2	65	72	7
3	84	81	3
4	92	88	4
5	70	66	4
6	55	60	5
7	88	82	6
8	62	75	13
9	80	77	3
10	74	71	3
11	69	73	4
12	91	85	6
13	77	79	2
14	83	87	4
15	68	63	5
Mean	—	—	**6.4**

These results met the pre-defined success criteria (≥ 80% agreement rate and ≤ 8-point LHI difference), suggesting that the AI can provide lawn health assessments closely aligned with professional evaluations.

6.2. Experiment 2: Prototype Evaluation of Core Platform Features

The prototype evaluation showed consistently high user-perceived usefulness across all four tested features.

Mean usefulness scores (5-point scale) ranged from **4.1 to 4.7**, with the **AI Lawn Analysis feature receiving the highest average score**.

A **one-way repeated measures ANOVA** was performed to compare differences across the four features. Results indicated a significant main effect ($F(3,42) = 4.02$, $p < 0.05$). Post-hoc pairwise comparisons with Bonferroni correction revealed that **AI Lawn Analysis (M = 4.7)** was rated significantly higher than Tool Management & Task Scheduling (M = 4.1, $p < 0.05$)**,** while differences among other features were not statistically significant.

Table 2. Perceived Usefulness Ratings of Core Features

Feature	**Mean Score**	**SD**	**% Rating ≥ 4**
Onboarding Questionnaire	4.3	0.6	87%
AI Lawn Analysis	4.7	0.5	100%
AI Assistant Interaction	4.5	0.5	93%
Tool Management & Task Scheduling	4.1	0.7	80%

6.3. Qualitative Feedback

Thematic analysis of open-ended responses revealed three recurring themes:

1. **Personalization Value** – Users appreciated tailored recommendations based on their yard size, time availability, and environmental preferences.
2. **Visual Diagnostics** – Highlighting damaged areas and weeds on a lawn map significantly increased user trust in AI assessments.
3. **Integrated Management** – Centralizing tool status and maintenance schedules reduced the cognitive load of managing multiple devices.

7. DISCUSSION

The results of both experiments in this study demonstrate that the proposed AI-driven lawn care platform can deliver significant value to end users by improving diagnostic accuracy, incorporating data visualization, and establishing a more reliable knowledge base for lawn management. However, some participants expressed concerns that external factors such as weather conditions may affect data collection, and highly experienced users (e.g., those with prior work in the horticultural industry) perceived the platform as offering limited additional value compared to their existing expertise.

7.1. Accuracy of AI Diagnostics

Experiment 1 shows that the AI-based lawn health assessment results are highly consistent with the conclusions of human experts, achieving an 86.7% match rate in problem categories and an average absolute difference of only 6.4 points in the Lawn Health Index (LHI). This indicates that the AI model can achieve consumer-grade precision in disease identification, weed invasion detection, and localized damage recognition. Even in some cases where the AI's score differed from the expert's by more than 8 points, it still accurately identified the primary problem category, ensuring that users receive targeted maintenance advice. The score differences primarily stemmed from variations in expert subjective judgments and unavoidable environmental changes during visual lawn assessment.

For example, in the case of *Creeping Buttercup* (*Ranunculus repens*), the AI not only accurately identified this invasive and toxic weed in the image but also provided detailed information, including its growth rate (able to cover 4 m^2 within one year), its depletion of potassium in the soil, and potential hazards. Based on this, the platform generated actionable treatment suggestions such as removing it with a fork or trowel, applying deep mulching to suppress growth, or, in severe cases, replacing turf or using chemical treatment. These scientifically grounded and straightforward recommendations greatly reduce the user's reliance on horticultural expertise, enabling non-specialists to effectively address lawn health issues.

7.2. Perceived User Value of Platform Features

This prototype test focused on four core features to evaluate their practical value and usability in lawn care. Seven participants completed the tasks and provided feedback, indicating that all functions had high potential value but also room for optimization [1].

1. **Onboarding Questionnaire**

   Most participants considered the questionnaire effective in guiding them to specify lawn size and shape, current maintenance practices, along with personal preferences and physical capability, enabling the system to provide more practical and customized recommendations. For example, one participant entered the lawn area, available weekly time, and selected the option to reduce chemical use; another expressed a preference for prioritizing native plant protection in biodiversity-related questions. Some participants suggested adding options for special situations such as pet activity zones, slopes, or mixed vegetation types to enable more accurate recommendations.

2. **AI Lawn Analysis**

   The AI analyzed sensor data and photos to generate the Lawn Health Index (LHI), mark damaged areas, identify weed types, and provide treatment suggestions, which earned strong approval. Some participants were impressed that the system could identify specific weeds such as Creeping Buttercup and provide both mechanical removal and chemical treatment options, including safety notes. Others suggested that representing health conditions with a color-coded heatmap would be more intuitive, and requested a "task priority" indicator to help address the most urgent issues within limited time.

3. **AI Assistant Chat with Photo Upload**

   Most participants found it convenient to upload photos and chat with the AI when encountering lawn problems. In one test, the AI analyzed a photo of a yellowing lawn, combined it with recent weather data, determined the cause, and suggested drainage improvements and watering [10] frequency adjustments. One participant described the experience as "like having a personal gardening consultant." However, some noted that image upload was slow under weak network conditions and suggested adding an offline cache or text-only mode to ensure functionality.

4. **Tool Management & AI Task Scheduling**

   Participants generally appreciated the practicality of managing equipment and task schedules in one place. The platform could automatically remind users of maintenance tasks such as blade replacement or mowing frequency adjustments, and update the schedule seasonally (e.g., adding leaf cleanup in autumn). Suggestions included adding compatibility with third-party brand tools, allowing "emergency task" insertion for sudden weather changes or pest outbreaks, and adding consumable inventory reminders (e.g., "mowing line running low" or "spray agent nearly depleted") for timely replenishment.

7.3. Comprehensive Analysis

Overall, the AI Lawn Analysis and AI Assistant Chat functions received the most positive feedback for their immediacy and expertise, while the onboarding questionnaire and tool management features offered long-term value in personalization and task coordination. Users' main improvement suggestions focused on three areas:

1. **Information Visualization** – Enhance graphical presentation of health analysis and add task priority indicators.
2. **Function Compatibility** – Support a wider range of tool brands and lawn types.
3. **Weak Network Adaptation** – Improve outdoor usability with text-only or offline modes.

These results indicate that the platform's four core features can meet diverse needs in intelligent lawn care and, through interface optimization, improved device compatibility, and enhanced environmental adaptability, can further improve user experience and practical applicability.

7.4. Integration Advantages of AI and IoT in Lawn Care

The platform integrates AI-based visual diagnostics with IoT connected tool management, forming a unique value proposition. By combining images captured by robotic mower cameras, environmental sensor data, and user-reported maintenance information, the system generates more accurate and contextually relevant recommendations. Unlike traditional solutions that rely on user self-judgment and fragmented management, this platform transforms the lawn care process into a linear AI-led workflow. Users can complete the entire chain from diagnosis to execution without frequently switching between tasks or making repeated trade-offs [3]. This model significantly reduces the cognitive load of planning and decision-making, increases the efficiency and consistency of lawn maintenance, and bridges the current gap where diagnosis, task scheduling, and equipment management remain isolated in existing solutions.

8. CONCLUSIONS

This study proposed *Greenhub*, an AI- and IoT-driven lawn care platform designed to address fragmentation in diagnosis, task management, and equipment control. Two experiments validated its core contributions: (1) AI lawn diagnostics achieved an 86.7% agreement rate with expert assessments and demonstrated consumer-grade precision in weed, disease, and damage identification; and (2) the prototype evaluation confirmed the usability and practical value of its four key features—onboarding questionnaire, AI lawn analysis, AI assistant chat, and tool management with task scheduling.

Results indicate that Greenhub can significantly reduce reliance on professional expertise, provide timely and actionable recommendations, and lower the cognitive burden of lawn management. At the same time, user feedback highlighted areas for improvement, including enhanced data visualization, broader tool compatibility, and better adaptability under weak network conditions.

While the platform offers clear benefits, several limitations remain. Internet connectivity is required for diagnostics and AI interactions, which may restrict rural adoption. In addition, the initial onboarding and IoT device integration could be time-consuming for inexperienced users. Future work will focus on expanding offline functionality, streamlining setup processes, and further validating system performance across larger and more diverse user groups.

9. LIMITATIONS

This study has several limitations. First, the platform requires collecting images of users' yards and environmental information. Although data encryption and access control were considered in the design, there remains a potential privacy risk, which requires further enhancement of security measures in subsequent deployments. Second, this experiment did not test under nighttime photography conditions, even though some participants expressed a desire for mowing to be completed at night so that a tidy lawn would be visible during the day. The accuracy of image capture and diagnosis under low-light conditions still needs verification. Third, the experimental environments were mainly within normal weather conditions, without evaluating performance and stability under extreme climates such as heavy rain, extreme heat, or low temperatures, limiting its generalizability to broader scenarios [13, 14].

10. FUTURE WORK

To address these limitations, future research can expand and optimize in several directions. First, privacy and security measures should be further enhanced, for example by introducing edge computing to reduce the transmission of raw images and sensitive data to the cloud, thereby minimizing data leakage risks at the source. Second, to meet the demand for nighttime mowing, hardware could incorporate low-light camera modules or infrared imaging technology, and AI models could be trained with nighttime image datasets to ensure consistent diagnostic accuracy across all times of day [3]. Third, broader environmental condition testing covering heavy rain, snow, and extreme temperatures should be conducted to assess platform stability and reliability in adverse climates.

In terms of functionality expansion, a community interaction module [1] could be introduced to allow users to share lawn care experiences and obtain real-time references from others in the same area. In special or complex scenarios, the system could also invite local experts via the community feature to provide customized guidance based on on-site conditions. Additionally, integration with more smart gardening devices such as automatic irrigation systems and weather forecasting services could be explored to build a more comprehensive intelligent lawn care ecosystem. Finally, future user research should include long-term longitudinal tracking to quantify the platform's real-world impact on lawn health improvement, user workload reduction, and overall user experience enhancement.

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Minzhou Wang, a UX/UI designer with expertise in smart hardware interfaces and human-centered design, has built her career around creating intuitive digital-physical experiences. Her work spans the full product lifecycle, from user research, journey mapping, and service design to interface prototyping and iterative testing. At Husqvarna Group, she leads the design of user journeys and interfaces for residential and commercial robotic mowers, shaping how users interact with advanced lawn care technologies. With a background in interactive design from SCAD, Minzhou combines design thinking with technical insight to deliver solutions that enhance usability, accessibility, and user satisfaction. A recipient of the Red Dot Design Award, she continues to push the boundaries of product experience design in both consumer and professional contexts, driven by a passion for bridging technology and everyday life.

Taoran Jiang is a UX/UI designer focused on creating intuitive and human-centered digital experiences. Her work emphasizes usability and accessibility, bridging technology with everyday interactions. She has received international recognition, including the International Design Awards, European Product Design Award, and Indigo Design Award. She continues to explore how design can enhance user experience and shape more meaningful interactions between people and technology.

Jingyi Ma,a dual-degree graduate student in Digital Media and Computer Science (HCI) at Georgia Tech, focuses on Human-AI Interaction, creativity, simulation, and immersive AR/VR systems. She has contributed to projects on VR-based assistive robotics and Responsible AI co-design for music education, aiming to bridge technology and human experience. She also brings industry experience in designing AI-powered creative tools and 3D simulation interfaces, combining design thinking with technical implementation.