

AgriScan: Next.js Powered Cross-Platform Solution for Automated Plant Disease Diagnosis and Crop Health Management

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Declaration

Availability of Data and Materials: The datasets utilized in the course of this study are accessible through the Plant Diseases Training Dataset repository, which can be found at the following link: <https://www.kaggle.com/datasets/nimalsankalana/plant-diseases-training-dataset>

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Competing Interests: Not Applicable.

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Authors' Contributions:

AP: Took on the responsibility for compiling results and creating graphs and tables. Additionally, played a key role in conducting an in-depth background study pertinent to the research.

TAS (corresponding author): Led pivotal tasks such as crafting a custom model, conducting training sessions, preparing datasets, drafting manuscripts, developing applications, coding and designing the application and overseeing maintenance and hosting duties

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Acknowledgments: Not Applicable.

Cover letter:

Date: 27th March 2024
Editorial Office

Journal of Electrical Systems and Information Technology

Dear Editor,

We are pleased to submit our research manuscript titled "AgriScan: Next.js Powered Cross-Platform Solution for Automated Plant Disease Diagnosis and Crop Health Management" for consideration for publication in the Journal of Electrical Systems and Information Technology. All authors of this manuscript have reviewed and unanimously agreed to its submission to your esteemed journal.

Our manuscript explores the critical area of plant disease diagnosis in agriculture, addressing the pressing need for enhanced detection, monitoring, and prediction methods to mitigate agricultural losses effectively. We believe our research is a significant contribution to your journal for the following reasons:

1. Relevance to the Journal's Focus:

Our paper introduces AgriScan, a cross-platform system aimed at automating plant leaf disease diagnosis. This innovative system aligns closely with the focus of the Journal of Electrical Systems and Information Technology, which highlights advancements in electrical systems and information technology.

2. Originality and Significance:

Our research presents a pioneering approach utilizing computer vision and Deep Learning (DL) techniques to classify 46 distinct disease categories, offering a comprehensive solution for automated plant disease diagnosis and crop health management. Notably, we have developed the application as a Progressive Web App (PWA) using NextJS, a novel approach in this domain.

3. Methodological Rigor:

Our study rigorously employs Convolutional Neural Networks (CNNs) trained on a substantial dataset comprising 96,206 images of both healthy and infected plant leaves. This meticulous approach ensures the robustness and reliability of our disease classification system. Additionally, we meticulously assess performance metrics such as classification accuracy and processing time to validate the efficacy of our approach. Furthermore, extensive testing of our application across multiple devices over a significant duration ensures its optimal functionality and performance.

4. Clear Presentation:

Our manuscript is meticulously structured, with clear explanations, figures, and tables that make it accessible to a broad audience, including researchers and practitioners in the field.

5. Implications and Applications:

AgriScan empowers farmers with a user-friendly interface accessible across multiple platforms, enabling real-time disease classification and optimizing crop productivity by facilitating timely intervention and prevention measures.

We affirm that this manuscript is exclusively submitted to Journal of Electrical Systems and Information Technology and is not under consideration in any other journal.

We appreciate your consideration of our work for publication in your esteemed journal. We are confident that our research can contribute to the ongoing advancement of agricultural technology by providing a robust and efficient solution for early leaf disease detection, which, in turn, can aid in crop protection and yield enhancement.

Should you require any additional information or clarification, please do not hesitate to contact me at touhidulalam@bgctub.ac.bd. We look forward to the opportunity for our research to undergo the peer review process.

Sincerely,

Touhidul Alam Seyam

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