Letter of Acceptance

TO

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Subject: Acceptance Letter – *2nd International Conference on Sustainable Computing and Data Communication Systems ICSCDS-2023* – Reg.

Dear Author

This is to inform you that your oral presentation proposal titled " **Implementation of Deep Convolution Neuro-Fuzzy Network to Plant Disease Detection, Risk Assessment, and Classification**" submitted to the 2nd International Conference on Sustainable Computing and Data Communication Systems ICSCDS-2023, which will be held on **23-25, March 2023** by Shree Venkateshwara Hi-Tech Engineering College Erode, India, has been accepted as a result of blind reviews.

All registered and presented papers will be submitted for inclusion into IEEE Xplore.

On behalf of the organization committee, I would like to congratulate you!

Yours sincerely,

Dr. P. Karuppusamy
Conference Chair,
ICSCDS 2023

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Implementation of Deep Convolution Neuro-Fuzzy Network to Plant Disease Detection, Risk Assessment, and Classification

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Abstract— Indian agriculture drives the economy. Sickness is common in plants exposed to several environmental conditions. This lowers crop quality. Due to recent weather changes, farmers' biggest issue is maximizing output quality and quantity. Diagnosing and treating crop diseases quickly maximizes agricultural productivity. Illnesses can reduce tomato crop yields, lowering farmers' income. To treat and control tomato leaf diseases, proper identification is crucial. Deep learning improved recognition accuracy. Artificial intelligence incorporates deep learning. Due to its self-directed learning and feature extraction benefits, academic and industry circles have been discussing it recently. Learning-based methods in plant leaf disease detection can speed up research, improve feature extraction, and loosen disease spot feature selection. To improve identification accuracy, deep learning now uses fuzzy rules to represent and manage fuzzy information. Using a deep neuro-fuzzy neural network, we classify rice plant illnesses. To extract complex features, the neuro-fuzzy network uses a fuzzy inference layer and a fuzzy pooling layer. Then classify them in the fully linked layer. A huge dataset of 8 types of infected and uninfected rice plant photos yielded a 96.9% identification accuracy for the moa del. Three performance indicators were also used. The trials show the benefits of employing NFNHDL to diagnose rice diseases.

Keywords—rice plant, Deep learning, fuzzy rules, neuro-fuzzy, fuzzy inference layer.

I. INTRODUCTION

Rice is an important grain that provides nourishment for billions of people all over the globe [1]. It is the principal source of nutrition in the countries of India, and Indonesia. Anything that affects the rice crop, both in terms of superiority and measure, has a global impact. As a result, regular illness monitoring and identification are very necessary in order to effectively combat the problem. Diseases may have a severe impact on production if they are not treated in a timely manner [2]. A multitude of diseases and pests have contributed to the degradation of rice crops in recent years. Without proper surveillance and management, these attacks may cause severe disruption on farms, and the problem has only gotten worse in recent years. In addition, the early and accurate identification of problems in plants saves rice from dangerous diseases and significantly lessens the amount of money lost. The treatment of these disorders is supportive of our efforts to assure healthy agriculture [1].

The ability to automatically identify plant illnesses based on plant leaves is a major step forward in the agricultural sector. The efficiency and quality of harvests may be improved via early and correct diagnosis of plant leaf diseases. In order to maximize crop superiority, it is crucial to prevent the spread of disease throughout the farm. Diseases may be contained if their symptoms are recognized, their causes for proliferation are investigated, and control measures are put into place. Plant diseases may cause problems for plants at all stages of their life cycle.

Plants that are unwell will often have discolored, wilted leaves. Generally speaking, it is possible to recognize abnormalities in the visual presentation of a disease by looking for its characteristic pattern. The leaves of a plant are usually the first to show signs of disease, making them an excellent resource for diagnosing plant ailments [3]. Semantic segmentation and picture identification are only two areas where deep learning techniques have been effectively used