Department of Electrical and Computer Engineering
North South University

Senior Design Project

Plant disease detection using Machine Learning

IBRAHIM RASHEL **ID# 1731627642**

ABU BAKAR SIDQUE **ID# 1811464642**

ASADUJJAMAN **ID# 1821301642**

Faculty Advisor:

Intisar Tahmid Naheen

Lecturer

ECE Department

Summer, 2023

LETTER OF TRANSMITTAL

December, 2023

To

Dr. Rajesh Palit
Chairman,
Department of Electrical and Computer Engineering
North South University, Dhaka

Subject: Submission of Capstone Project Report on “Plant Disease Detection using Machine Learning ”

Dear Sir,

With due respect, we would like to submit our Capstone Project Report on “Plant Disease Detection using Machine Learning ” as a part of our BSc program. The project on Plant Disease Detection System using Machine Learning was of immense significance to us, providing invaluable practical experience in the field. Our efforts aimed at maximizing competence to address all aspects outlined in this report, reflecting our commitment to applying machine learning for real-world impact.

We will be highly obliged if you kindly receive this report and provide your valuable judgment. It would be our immense pleasure if you find this report useful and informative to have an apparent perspective on the issue.

Sincerely Yours,

.....
Ibrahim Rashel
ECE Department
North South University, Bangladesh

.....
Abu Bakar Sidque
ECE Department
North South University, Bangladesh

.....
Asadujjaman
ECE Department
North South University, Bangladesh

APPROVAL

Ibrahim Rashel (1731627642), Abu Bakar Sidque (1811464642) and Asadujjaman (1821301642) from Electrical and Computer Engineering Department of North South University, have worked on the Senior Design Project titled **"Plant Disease Detection using Machine Learning"** under the supervision of Intisar Tahmid Naheen partial fulfillment of the requirement for the degree of Bachelors of Science in Engineering and has been accepted as satisfactory.

Supervisor's Signature

…….

Intisar Tahmid Naheen

Lecturer

Department of Electrical and Computer Engineering

North South University

Dhaka, Bangladesh.

Chairman's Signature

…….

Dr. Rajesh Palit

Professor

Department of Electrical and Computer Engineering

North South University

Dhaka, Bangladesh.

DECLARATION

This is to declare that this project is our original work. No part of this work has been submitted elsewhere partially or fully for the award of any other degree or diploma. All project related information will remain confidential and shall not be disclosed without the formal consent of the project supervisor. Relevant previous works presented in this report have been properly acknowledged and cited. The plagiarism policy, as stated by the supervisor, has been maintained.

Students' names & Signatures

---

1. Ibrahim Rashel

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

2. Abu Bakar Sidque

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

3. Asadujjaman

ACKNOWLEDGEMENTS

The authors would like to express their heartfelt gratitude towards their project and research supervisor, Intisar Tahmid Naheen, Lecturer, Department of Electrical and Computer Engineering, North South University, Bangladesh, for his invaluable support, precise guidance and advice pertaining to the experiments, research and theoretical studies carried out during the course of the current project and also in the preparation of the current report.

Furthermore, the authors would like to thank the Department of Electrical and Computer Engineering, North South University, Bangladesh for facilitating the research. The authors would also like to thank their loved ones for their countless sacrifices and continual support.

ABSTRACT

Plant disease detection using Machine Learning

Plant disease detection is a critical aspect of precision agriculture, facilitating early intervention to minimize crop losses and ensure food security. This research leverages machine learning techniques, specifically ResNet50, Nasnet, and a custom Fewshot learning model, for accurate identification of plant diseases based on the PlantVillage dataset. The study addresses the limitations of existing research by exploring the effectiveness of Fewshot learning and conducting a comprehensive comparative analysis of multiple model architectures. Through extensive experimentation and evaluation, the ResNet50 model emerged as the most accurate, achieving a validation accuracy of 96%. The Fewshot learning model, while demonstrating lower accuracy, showcased potential in scenarios with limited labeled examples. The research contributes to the advancement of plant disease detection technologies, offering insights into the practical implications of different model architectures and paving the way for future developments in sustainable and resilient agriculture.