

CROP PEST CLASSIFICATION AND PESTICIDE RECOMMENDATION SYSTEM USING DEEP LEARNING TECHNIQUES

A PROJECT-II REPORT SUBMITTED IN FULFILMENT OF THE REQUIREMENTS
FOR THE AWARD OF THE DEGREE OF

**BACHELOR OF TECHNOLOGY
IN
COMPUTER SCIENCE AND ENGINEERING (AI & ML)**



By
Batch – B7

N. Naga Sai Harani (19JG1A0578)

R. Sai Tulasi Prasanna (19JG1A05A1)

P. SandhyaRani (19JG1A0590)

P. Chethanambhika (19JG1A0583)

Under the esteemed guidance of

Mr. K. Purushotam Naidu

Assistant Professor

CSE Department

Department of Computer Science and Engineering (AI&ML)

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

[Approved by AICTE NEW DELHI, Affiliated to JNTUK Kakinada]

[Accredited by National Board of Accreditation (NBA) for B. Tech CSE, ECE, IT- valid from 2019-22 and 2022-25]

[Accredited by National Assessment and Accreditation Council (NAAC) with A Grade- Valid from 2022-27]

Kommadi, Madhurawada, Visakhapatnam – 530048

2019 – 2023

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI&ML)



CERTIFICATE

This is to certify that the Project-II report titled “**Crop Pests Classification and Pesticide Recommendation System Using Deep Learning Techniques**” is a bonafide work of following IV B.Tech. –II Sem. students in the Department of Computer Science and Engineering, Gayatri Vidya Parishad College of Engineering for Women affiliated to JNT University, Kakinada during the academic year 2022-23, in fulfillment of the requirement for the award of the degree of Bachelor of Technology of this university.

N. Naga Sai Harani (19JG1A0578)

P. SandhyaRani (19JG1A0590)

R. Sai Tulasi Prasanna (19JG1A05A1)

P. Chethanambhika (19JG1A0583)

Signature of the Guide

Mr. K. Purushotam Naidu

Asst. Professor,

Dept. of CSE

Signature of the HOD

Dr. P. V. S. L. Jagadamba MTech., Ph.D

Professor,

Dept. of CSE

External Examiner ACKNOWLEDGEMENT

The satisfaction that accompanies the successful completion of any task would be incomplete without the mention of people who made it possible and whose constant guidance and encouragement crown all the efforts with success.

We feel elated to extend our sincere gratitude to **Mr. K. Purushotam Naidu**, Assistant Professor for encouragement all the way during analysis of the project. His annotations, insinuations and criticisms are the key behind the successful completion of the thesis and for providing us all the required facilities.

We would like to take this opportunity to extend our gratitude to Project Coordinator, **Dr. N. Sharmili**, Associate Professor of Computer Science and Engineering for making us to follow a defined path and for advising us to get better improvements in the project.

We express our deep sense of gratitude and thanks to **Dr. P. V. S. Lakshmi Jagadamba**, Professor and Head of the Department of Computer Science and Engineering for her guidance and for expressing her valuable and grateful opinions in the project for its development and for providing lab sessions and extra hours to complete the project.

We would like to take this opportunity to express our profound sense of gratitude to **Dr. R. K. Goswami**, Principal and **Dr. G. Sudheer**, Vice Principal for allowing us to utilize the college resources thereby facilitating the successful completion of our thesis.

We are also thankful to both teaching and non-teaching faculty of the Department of Computer Science and Engineering for giving valuable suggestions from our project.

N. Naga Sai Harani (19JG1A0578)

R. Sai Tulasi Prasanna (19JG1A05A1)

P. SandhyaRani (19JG1A0590)

P. Chethanambhika (19JG1A0583)

TABLE OF CONTENTS

TOPICS	PAGE NO.
ABSTRACT	i
LIST OF FIGURES	ii
LIST OF TABLES	iii
LIST OF SCREENS	iv
LIST OF ACRONYMS	v
1. INTRODUCTION	1-3
1.1 MOTIVATION	1
1.2 PROBLEM DEFINITION	1
1.3 OBJECTIVE OF THE PROJECT	2
1.4 ADVANTAGES OF THE PROJECT	2
1.5 LIMITATIONS OF THE PROJECT	2
1.6 ORGANIZATION OF PROJECT	2
2. LITERATURE SURVEY	4-23
2.1 INTRODUCTION	4
2.2 EXISTING SYSTEM	21
2.3 DISADVANTAGES OF EXISTING SYSTEM	21
2.4 PROPOSED SYSTEM	22
2.5 ADVANTAGES OF PROPOSED SYSTEM	23
2.6 CONCLUSION	23
3. REQUIREMENT ANALYSIS	24-30
3.1 INTRODUCTION	24
3.2 FUNCTIONAL REQUIREMENTS	24
3.2.1 Software Requirements	24
3.2.2 Hardware Requirements	26
3.3 NON-FUNCTIONAL REQUIREMENTS	27
3.4 FLOWCHARTS	28
3.4.1 Flowchart for Data Extraction	28
3.4.2 Flowchart for Data PreProcessing	29

TABLE OF CONTENTS

TOPICS	PAGE NO.
3.4.3 Flowchart for training the data	30
4. DESIGN	31-38
4.1 INTRODUCTION	31
4.2 UML DIAGRAMS	32
4.2.1 Use-Case Diagram	32
4.2.2 Class Diagram	34
4.2.3 Sequence Diagram	35
4.3 MODULE DESIGN	37
4.3.1 User Module	37
4.3.2 System Module	37
4.4 CONCLUSION	38
5. IMPLEMENTATION AND RESULTS	39-69
5.1 INTRODUCTION	39
5.2 DEEP LEARNING MODELS	40
5.2.1 CNN Models	41
5.3 SOFTWARE DESIGN	43
5.3.1 Front-End Design	43
5.3.2 Back-End Design	44
5.3.3 Data Extraction	45
5.3.4 Data Pre-processing	46
5.3.5 Training the Models	46
5.4 SAMPLE CODE	49
5.4.1 Front End	49
5.4.2 Back End	58
5.5 OUTPUT SCREENS	63
5.6 RESULTS AND ANALYSIS	69
6. TESTING AND VALIDATION	70-74
6.1 INTRODUCTION	70

TABLE OF CONTENTS

TOPICS	PAGE NO.
6.1.1 Scope	70
6.1.2 Defects and Failures	70
6.1.3 Compatibility	71
6.1.4 Input Combinations and Preconditions	71
6.1.5 Static vs. Dynamic Testing	71
6.1.6 Types of Testing	72
6.1.7 Software verification and validation	73
6.2 DESIGN OF TEST CASES AND SCENARIOS	73
6.3 VALIDATION TESTING	74
6.4 CONCLUSION	74
7. CONCLUSION	75
8. REFERENCES	76-78