RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CO-PO Mapping of Project in the area of Application of Digital Image Processing

Title of the Project: Tomato Leaf Disease Detection Using CNN

Area of the Project: Digital Image Processing

Methodology: Simulation

Name of the Supervisor: Dr. P.V GOPI KRISHNA RAO

Name of the Students:

T. BINDU MADHAVI (19091A0424)
K.YERIKALAIAH (19091A04S5)
T. VAMSI (19091A04P7)
S.NAVEEN KUMAR (19091A04C3)

Abstract:

Plant diseases cause low agricultural productivity. Plant diseases are challenging to control and identify by the majority of farmers. In order to reduce future losses, early disease diagnosis is necessary. This study presents a deep learning approach for detecting tomato leaf diseases using Convolutional Neural Networks (CNNs). The proposed method involves preprocessing the tomato leaf images, followed by training the CNN model to classify them into one of ten categories: healthy, yellow leaf curl virus (YLCV), bacterial spot (BS), early blight (EB), leaf mold (LM), spectoria leaf spot (SLS) target spot (TS), two spotted spider mite spot(TSSMS), mosaic virus(MV) and late blight (LB). The model was trained using a dataset of 16021 tomato leaf images. The training was conducted for 10 epochs, 20 epochs, and 50 epochs, and the accuracy achieved was 64%, 94%, and 97%, respectively. These results demonstrate the effectiveness of the proposed approach in detecting tomato leaf diseases, and the performance improves with increasing epochs. The automated approach can aid in the early detection and prevention of tomato diseases, which can ultimately help in improving the yield and quality of tomato crops.

19/10/2023

HEAD OF THE DEPARTMENT
Dr. KETHEPALLI MALLIKARJUNA
B.E, M.Tech, Ph.D, MISTE, FIETE, MIE
Professor & HOD
Department of ECE
RGM College of Engg. & Tech. (Autonomous)
NANDYAL - 518 501, Kurnool (Dist), A.P.

PRINCIPAL
Dr. T. JAYACHANDRA PRASAD
M.E,Ph.D.,
PRINCIPAL
R G M College of Engg. & Tech.,
(Autonomous)
NANDYAL-518 501, Nandyal (Dt), A.P.

Process of CO-PO attainment for Project thesis of IV-year Main Project

Course Outcomes:

[1] To identify the problem formulation of the project after literature surveyor study of existing technology
[2] To analyze the basic concepts of the project in correlation with theengineering knowledge
[3] To apply the concepts of technology with modern tool usage to overcomethe problem.
[4] To formulate the solution and to design simulation and prototype of thesolution with the engineering knowledge.

CO-PO Mapping:

CO/P O	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
CO1	2	-	-	-	-	-	-	-	3	-	-	-
CO2	2	-	2	-	-	-	-	-	3	-	-	-
CO3	2	-	-	-	-	-	-	-	3	-	3	-
CO4	2	-	2	-	2	-	-	-	3	-	3	-

Evaluation:

Project work	100	External evaluation	This end viva voce in project work for 100 marks
	25	Internal evaluation	These 25 marks will be based on the performance ofthe student in the project reviews apart from attendance and regularity

Table: Percentage Weightages for each CO

S.No	REG	IM 25M	EM grade	TM 125M	EM 100M	% IM	% EM	CO1	CO2	CO3	CO4	N.CO1	N.CO2	N.CO3	N.CO4
1	19091A0424	21	9	112	91	84	91	21.28	32.48	17.92	17.92	79.89	97.44	89.64	89.64
2	19091A04S5	23	10	118	95	92	95	22.56	34.08	18.88	18.88	84.62	102.25	94.44	94.44
3	19091A04P7	19	10	114	95	76	95	21.28	33.44	18.24	18.24	79.81	100.33	91.24	91.24
4	19091A04C3	19	9	109	90	76	90	20.48	31.84	17.44	17.44	76.81	95.52	87.24	87.24

Table: Weightage marks for each CO

	CO1	CO2	CO3	CO4
Internal	40	20	20	20
External	20	40	20	20
Average	26.66	33.33	19.99	19.99

Table: Percentage Attainment Values for each CO

	Co1		C02		C03		Co4	
Above & Equal 60%	3	3	3	3	3	3	3	3
Between 40-60%	0	2	0	2	0	2	0	2
Below40%	0	1	0	1	0	1	0	1
Total students	4		4		4		4	
Attainment value		3.00		3.00		3.00		3.00
% of attainment		100.00		100.00		100.00		100.00
Attained or not (Greater 50% Y, Not Means N)		Y		Y		Y		Y

Dr. Kethepalli Mallikarjuna
HOD of ECE

Dr. KETHEPALLI MALLIKARJUNA
B.E, M.Tech, Ph.D, MISTE, FIETE, MIE
Professor & HOD
Department of ECE
RGM College of Engg. & Tech. (Autonomous)
NANDYAL - 518 501, Kurnool (Dist), A.P.

Dr.T.Jayachandra Prasad
Principal

Dr. T. JAYACHANDRA PRASAD
M.E., Ph.D.,
PRINCIPAL
R.G.M. College of Engg. & Tech.,
NANDYAL-518 501, Nandyal (Dt), A.P.

PROJECT REPORT ON

TOMATO LEAF DISEASE DETECTION USING CNN

Submitted in partial fulfilment of the Requirement
for the award of the degree of

BACHELOR OF TECHNOLOGY
IN
ELECTRONICS AND COMMUNICATION ENGINEERING

Submitted by

Project Associates	Regd. No
T. Bindu Madhavi	19091A0424
K. Yerikalaiah	19091A04S5
T. Vamsi	19091A04P7
S, Naveen Kumar	19091A04C3

Under the Esteemed Guidance of

Dr. P. V. Gopi Krishna Rao
Ph. D, MISOI, MIAENG
Professor, RGMCET, Nandyal

(ESTD-1995)

DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING

RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

Affiliated to J.N.T.U.A - Anantapuramu, Approved by A.I.C.T.E - New Delhi,
Accredited by N.B.A - New Delhi, Accredited by NAAC with A+ Grade – New Delhi

NANDYAL -518501, Nandyal Dist. A.P.

YEAR: 2019 - 2023

Dr. KETHEPALLI MALLIKARJUNA
B.E, M.Tech, Ph.D, MISTE, FIETE, MIE
Professor & HOD
Department of ECE
RGM College of Engg. & Tech. (Autonomous)
NANDYAL - 518 501, Kurnool (Dist), A.P.

Dr. T. JAYACHANDRA PRASAD
M.E,Ph.D.,
PRINCIPAL
R G M College of Engg. & Tech.,
(Autonomous)
NANDYAL-518 501, Nandyal (Dt), A.P.

RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING & TECHNOLOGY

AUTONOMOUS

(Approved by A.I.C.T.E - New Delhi, Affiliated to JNTUA - Anantapuramu, Accredited by NBA - New Delhi, Accredited by NAAC with 'A+' Grade - New Delhi)

NANDYAL - 518 501, A.P, India

CERTIFICATE

This is to certify that the dissertation entitled "TOMATO LEAF DISEASE DETECTION USING CNN " is being submitted by T. Bindu Madhavi (19091A0424), K. Yerikalaiah (19091A04S5), T. Vamsi (19091A04P7), S. Naveen Kumar (19091A04C3) under the guidance of Dr. P. V Gopi Krishna Rao, Professor for Project of the award of B.Tech Degree in Electronics and Communication Engineering, Rajeev Gandhi Memorial College of Engineering & Technology, Nandyal (Autonomous) (Affiliated to J.N.T.U.A Anantapuramu) is a record of bonafide work carried out by them under our guidance and supervision.

Dr. Kethepalli Mallikarjuna
Head of the Department

Dr. V.N.V. SATYA PRAKASH
M.Tech, (Ph.D), MISTE, MIETE, MIE.
Professor
Department of E C E.
R G M College of Engg & Tech., (Autonomous)
NANDYAL - 518 501, Kurnool (Dist), A.P.

3/5/23

Dr. P. V. Gopi Krishna Rao
Project Guide
Professor
Department of ECE
RGM College of Engg. & Tech. (Autonomous)
NANDYAL-518 501, Kurnool (Dist), A.P.

Signature of the External Examiner

Date of Viva-Voce: 05/05/2023

ABSTRACT

Plant diseases cause low agricultural productivity. Plant diseases are challenging to control and identify by the majority of farmers. In order to reduce future losses, early disease diagnosis is necessary. This study presents a deep learning approach for detecting tomato leaf diseases using Convolutional Neural Networks (CNNs). The proposed method involves preprocessing the tomato leaf images, followed by training the CNN model to classify them into one of ten categories: healthy, yellow leaf curl virus (YLCV), bacterial spot (BS), early blight (EB), leaf mold (LM), spectoria leaf spot (SLS) target spot (TS), two spotted spider mite spot(TSSMS), mosaic virus(MV) and late blight (LB). The model was trained using a dataset of 16021 tomato leaf images. The training was conducted for 10 epochs, 20 epochs, and 50 epochs, and the accuracy achieved was 64%, 94%, and 97%, respectively. These results demonstrate the effectiveness of the proposed approach in detecting tomato leaf diseases, and the performance improves with increasing epochs. The automated approach can aid in the early detection and prevention of tomato diseases, which can ultimately help in improving the yield and quality of tomato crops.

Dr. KETHEPALLI MALLIKARJUNA
B.E, M.Tech, Ph.D, MISTE, FIETE, MIE
Professor & HOD
Department of ECE
RGM College of Engg. & Tech. (Autonomous)
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M.E.,Ph.D.,
PRINCIPAL
RGM College of Engg. & Tech.,
(Autonomous)
NANDYAL-518 501, Nandyal (Dt), A.P.

CHAPTER - 7

CONCLUSION AND FUTURE SCOPE

7.1 Conclusion

In this project, we have presented a approach for tomato leaf disease detection using convolutional neural networks (CNN). We trained a deep learning model using a dataset of tomato leaf images, which was collected from various sources. The trained model was able to accurately detect the presence of ten common tomato leaf diseases, namely, bacterial spot, early blight, late blight, leaf mold, spectorial leaf spot, spider mites two spotted spider mite, target spot, yello leaf curl virus, mosaic virus and healthy. The proposed system is designed to provide an easy-to-use and efficient solution for detecting tomato leaf diseases. It uses a web interface page that allows end-users to upload images of tomato leaves and get real-time predictions on the presence of diseases. The system is capable of processing a large number of images quickly, making it ideal for use in agricultural applications.

7.2 Future Scope

Tomato leaf disease detection using CNN has great potential for future applications. Here are some possible future scopes for this technology:

- Real-time disease detection: The current project used pre-captured images of tomato leaves for disease detection. In the future, the system can be designed to detect diseases in real-time using a camera attached to a robotic arm that moves around the tomato plants. This would enable early detection and treatment of diseases, thus improving crop yields and reducing losses.
- Transfer learning: The current project used a CNN model. In the future, transfer learning can be used to improve the accuracy of the model. This would involve using pre-trained CNN models that have been

trained on a large dataset and fine-tuning them on the tomato leaf disease dataset.

- Deployment on mobile devices: The current project was implemented on a desktop computer. In the future, the system can be optimized for deployment on mobile devices such as smartphones and tablets. This would enable farmers to use the system in the field for real-time disease detection and treatment.

Dr. KETHEPALLI MALLIKARJUNA
B.E, M.Tech, Ph.D, MISTE, FIETE, MIE
Professor & HOD
Department of ECE
RGM College of Engg. & Tech. (Autonomous)
NANDYAL - 518 501, Kurnool (Dist), A.P.

Dr. T. JAYACHANDRA PRASAD
M.E,Ph.D.,
PRINCIPAL
RGM College of Engg. & Tech.,
(Autonomous)
NANDYAL-518 501, Nandyal (Dt), A.P.