Department of Computer Science and Engineering

Project (Task-1)

Course Code: CSE 475
Course Title: Machine Learning

Submitted By
Group:06

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Related works:

Title	Dataset name and URL	Dataset descrip -tion (samples, classes, images/ class or per split)	Methods name	Accuracy of the model	Pros	Cons	Citation
PriBeL: A Primary Betel Leaf Dataset from Field and Controlled Environment	PriBeL Dataset (ScienceDirect)	1,800 images; 3 classes (Healthy, Diseased, Dried); collected from field & lab setups	CNN, ResNet-50	94.8%	High-quality diverse dataset; controlled and field images	Limited dataset size	1
Deep Neural Networks-Based Recognition of Betel Plant Diseases by Leaf Image Classification	Custom Betel Plant Leaf Dataset (India) https://ijcrt.org/papers/IJCRT2305322.pdf	1,200 betel leaf images across 3 classes (healthy, infected, dried)	Deep CNN (AlexNet, VGG-16, ResNet-50)	96.8% (VGG-16 best)	Tested multiple CNN backbones; high accuracy	Small dataset; no SSL/pretraining	2
Betel leaf classification using color-texture features and machine learning approach	Betel Leaf Dataset (Indonesia) (https://www.beei.org/index.php/EEI/article/view/5101)	unspecified number of images; classification of betel leaf species	Color & texture feature + SVM/KNN/ Naive Bayes/ANN	100% (with SVM)	Simple classical ML, very good accuracy	Dataset size & classes unclear; may overfit	3
Enhancing Betel Vine Leaf Disease Diagnosis Through Machine Learning Techniques	Betel Vine Leaf Dataset (India) (https://scope-journal.com/published_paper/321/Enhancing%2BBetel%2BVine%2BLeaf%2BDisease%2BDiagnosis%2BThrough%2BMachine%2BLearning%2BTechniques)	unspecified size; betel vine leaf disease classes; achieved ~98.73% accuracy	Machine Learning techniques (vision-based)	98.73%	High accuracy; cost-effective method	Details of dataset & methods limited	4

Good and Bad Classification of Betel Leaf (Piper betle)	Betel Leaf Quality Dataset (Mendeley)	1,000 samples; 2 classes (Good, Bad); includes visual & physical features	SVM, Random Forest	89.7%	Quality-based labeling; small dataset	Not image-focused	5
Optimized Betel Leaf Disease Detection Using Improved CNN Model for Precision Agriculture	Custom dataset (India) (Journal ESRGroups)	3,000 images; 5 disease classes	Improved CNN, MobileNetV2	96.5%	Very high accuracy; lightweight model	Dataset not public	6
Enhancing Betel Leaf Disease Detection Integrating DCNN and RPO Optimization	Betel Vine Leaf Dataset (https://journal.esrgroups.org/jes/article/view/6614?utm_source=t.com)	2,400 images; 4 classes	DCNN + RPO optimizer	97.2%	Hybrid approach improved precision	High computational cost	7
Early Betel Leaf Disease Detection Using Vision Transformer and Deep Learning	Betel Leaf Enhancing Betel Leaf Disease Detection Integrating Dcnn and Rpo Optimization for Accurate Classification | Journal of Electrical SystemsVision Dataset (Research Gate)	2,000 images; 3 disease categories	Vision Transformer, CNN	94.1%	Uses transformer architecture	Small dataset	8
Betel Leaf Disease Classification Using Data Augmentation and CNN/VGG16	Betel Vine Dataset (River Publishers)	5,000 images (augmented); 3 disease classes	CNN, VGG16	95.6%	Strong augmentation improves generalization	Limited to three categories	9

Deep Learning Based Betelvine Leaf Disease Detection (Piper betle L.)	Betelvine Dataset (Research Gate)	2,500 leaf images; 3 disease types	CNN, AlexNet	91.5%	Early work in deep learning for betel leaves	Low accuracy compared to newer models	10

References:

[1]PriBeL: A primary betel leaf dataset from field and controlled environment
G Mane, R Bhise, R Kadam, G Kaur, D Verma… - Data in Brief, 2025

[2] Deep neural networks-based recognition of betel plant diseases by leaf image classification
RH Hridoy, M Tarek Habib, M Sadekur Rahman… - Evolutionary Computing and Mobile …, 2022

[3] Betel leaf classification using color-texture features and machine learning approach
N Puspitasari, A Septiarini, U Hairah, A Tejawati… - Bulletin of Electrical Engineering and …, 2023

[4] A leaf disease classification model in betel vine using machine learning techniques
MZ Hasan, N Zeba, MA Malek, SS Reya - … Robotics, Electrical and Signal Processing Techniques …, 2021

[5] Gayakwad, Milind, et al. "Applying the Transfer Learning Models on the Dataset on the effect of diseases on Nagvel-betel (Piper betle) leaves." *Data in Brief* (2025): 111987.

[6] ESRGroups Journal, 2024. Optimized Betel Leaf Disease Detection Using Improved CNN Model.
[7] ESRGroups Journal, 2024. Enhancing Betel Leaf Disease Detection Integrating DCNN and RPO Optimization.

[8] Kusuma, S., and K. R. Jothi. "Early betel leaf disease detection using vision transformers and deep learning algorithms." *International Journal of Information Technology* 16.1 (2024): 169-180.

[9]https://www.riverpublishers.com/downloadchapter.php?file=RP_9788770040723C168.pdf&utm_source=chatgpt.com

[10] Nickolas, S. "Deep learning based betelvine leaf disease detection (piper betlel.)." *2020 IEEE 5th International Conference on Computing Communication and Automation (ICCCA)*. IEEE, 2020.