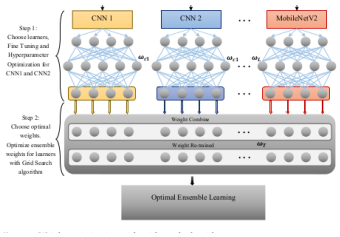
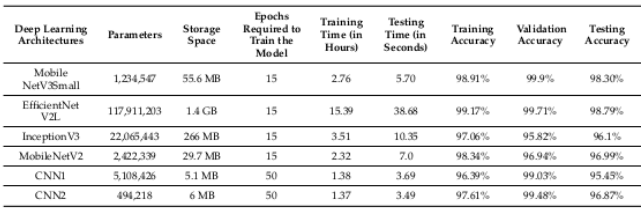
Department of Computer Science and Engineering
Bangladesh University of Business and Technology (BUBT)

CSE 498: Literature Review Records

Student's Id and Name	**Name:** Mustain Murtaza Taib and **ID:** 18193103003
Capstone Project Title	Design of Efficient Methods for the Detection of Tomato Leaf Disease Utilizing Proposed Ensemble CNN Model
Supervisor Name & Designation	**Name:** Mr.T.M. Amir - Ul - Haque Bhuiyan & **Designation:** Assistant Professor,Department of CSE, BUBT
Course Teacher's Name & Designation	**Name:** Khan Md. Hasib & **Designation:** Assistant Professor, Department of CSE, BUBT

Aspects	Paper # 1 (Title)
Title / Question (What is problem statement?)	Design of Efficient Methods for the Detection of Tomato Leaf Disease Utilizing Proposed Ensemble CNN Model
Objectives / Goal (What is looking for?)	They introduce two novel convolutional neural network (CNN) models alongside four well-known CNN models, and employ fine-tuning and hyperparameter optimization techniques using particle swarm optimization (PSO) and grid search. Triple and quintuple ensemble models are created, and the dataset is classified using five-fold cross-validation. The experimental results demonstrate that the proposed ensemble models exhibit fast training and testing times, achieving exceptional classification performance with an accuracy of 99.60%. This research simplifies and expedites the early detection of plant diseases, aiding experts in preventing the spread of infections.
Methodology / Theory (How to find the solution?)	• This section covers methods for tomato plant leaf disease classification, utilizing CNNs for automatic feature extraction. EfficientNet optimizes network performance through composite scaling, while InceptionV3 and GoogleNet enhance architecture efficiency with parallel computing and reduced parameters.
Software Tools (What program/software is used for design, coding and simulation?)	Google colab, keras,Tensorflow,pandas,numpy,matplot ,os.
Test / Experiment How to test and characterize the design/prototype?	
Simulation/Test Data (What parameters are determined?)	Datasets : Bacterial Spot,Early Blight,Healthy,Late Blight, Leaf Mold,Mosaic virus,Septoria Leaf Spot,Two Spotted Spider Mites,Target Spot,Yellow Leaf Curl Virus.
Result / Conclusion (What was the final result?)	
Obstacles/Challenges (List the methodological obstacles if authors mentioned in the article)	They didn't face any challenges
Terminology (List the common basic words frequently used in this research field)	CNN; deep learning; fine tuning; hyperparameter optimization; tomato disease;

Deep Learning Architectures	Parameters	Storage Space	Epochs Required to Train the Model	Training Time (in Hours)	Testing Time (in Seconds)	Training Accuracy	Validation Accuracy	Testing Accuracy
Mobile NetV3Small	1,234,547	55.6 MB	15	2.76	5.70	98.91%	99.9%	98.30%
EfficientNet V2L	117,911,203	1.4 GB	15	15.39	38.68	99.17%	99.71%	98.79%
InceptionV3	22,065,443	266 MB	15	3.51	10.35	97.06%	95.82%	96.1%
MobileNetV2	2,422,339	29.7 MB	15	2.32	7.0	98.34%	96.94%	96.99%
CNN1	5,108,426	5.1 MB	50	1.38	3.69	96.39%	99.03%	95.45%
CNN2	494,218	6 MB	50	1.37	3.49	97.61%	99.48%	96.87%

Review Judgment (Briefly compare the objectives and results of all the articles you reviewed)	It gets highest accuray 99.9% using MobileNetV3Small which better than this paper "Yu, Y.; Samali, B.; Rashidi, M.; Mohammadi, M.; Nguyen, T.N.; Zhang, G. Vision-based concrete crack detection using a hybrid framework considering noise effect. J. Build. Eng. 2022, 61, 105246. [CrossRef]"
Review Outcome This paper was great validation accuracy using mobilenetv3 and they used other model like Ineptionv3 and MobileNetv2	