## 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	AlexNet Convolutional Neural Network for Disease Detection and Classification of Tomato Leaf
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?)	AlexNet Convolutional Neural Network for Disease Detection and Classification of Tomato Leaf
Objectives / Goal (What is looking for?)	With limited resources and increasing plant diseases, automation becomes crucial. This study employs an AlexNet-based CNN on Android to predict tomato diseases from leaf images. A dataset of 18,345 training and 4,585 testing samples, with ten disease labels and 64x64 RGB pixels, is used. The optimized model achieves high accuracy (98%), precision (0.98), recall (0.99), F1-score (0.98), and low loss (0.1331), ensuring precise and reliable disease classification.
Methodology / Theory (How to find the solution?)	Convolution layers use trainable kernels for convolutions and activation functions for feature map generation. Subsampling layers employ non-trainable kernels for downsampling using methods like average or max pooling, and can have trainable parameters. CNN learning involves selecting an architecture like modified AlexNet, using Adam optimizer with learning rate 0.005, and updating neuron weights with gradient descent. The input image size is 64x64 RGB pixels, employing ReLU activation in convolution with Alexnet architecture and max pooling layers, followed by flattening, dense layers with ReLU, and a Softmax activation for the output layer.
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?	Conv20
Simulation/Test Data (What parameters are determined?)	Datasets: Healthy, Bacterial spot, Late blight, Septoria spot, Yellow curved
Result / Conclusion (What was the final result?)	No         Disease         Precision         Recall         F-Measure         Accuracy           1         Bacterial Spot         0.98         0.96         0.97           2         Early blight         0.94         0.94         0.94           3         Late blight         0.95         0.95         0.95           4         Leaves mold         0.98         0.97         0.97           5         Septoria leaf mold         0.95         0.95         0.95           6         Spider mites         0.95         0.96         0.96         0.96           7         Target spot         0.93         0.94         0.94           8         Yellow leaf curl virus         0.97         0.99         0.98           9         Tomato mosaic virus         0.98         1         0.99           10         Healthy         1         0.97         0.98
Obstacles/Challenges (List the methodological obstacles if authors mentioned in the article)	Team didnt find any challenges
<b>Terminology</b> (List the common basic words frequently used in this research field)	AlexNet modification; tomato diseases; leaf image; AI.  ii

Review Judgment (Briefly compare the objectives and results of all the articles you reviewed)	The research demonstrates that the CNN algorithm with a modified AlexNet architecture, combined with preprocessing and classification methods, achieves high accuracy (96%), precision (98%), recall (95%), and F-Measure (97
Review Outcome	This paper didn't use updated model