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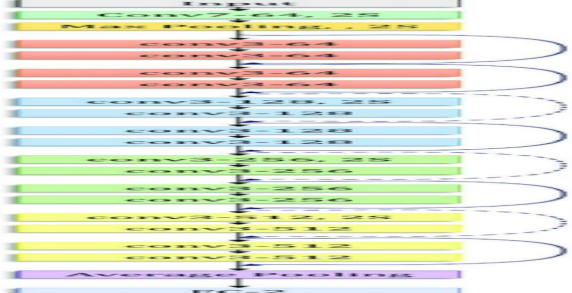
Bangladesh University of Business and Technology (BUBT)

CSE 498: Literature Review Records

Student's Id and Name	**Name:** Bm.Shadman Sakib Mahee and **ID:** 19201103123
Capstone Project Title	Mango Fruit Disease Detection
Supervisor Name & Designation	**Name:** M. M. Fazle Rabbi & **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 # 2 (Title)
Title / Question (What is problem statement?)	Detection of plant diseases using finetuned ResNet18 has been developed for multiple plant species, including Tomato, Grape, Orange, Soybean, Squash, Potato, Corn (Maize), and Strawberry
Objectives / Goal (What is looking for?)	The objective of this project is to develop a plant disease detection system using a finetuned ResNet18 model that can accurately identify several types of plant diseases in crops such as tomato, grape, orange, soybean, squash, potato, corn (maize), and strawberry. The system will help farmers detect diseases early and take appropriate action to prevent crop loss, leading to increased yields and profitability. The project aims to contribute to sustainable agriculture by reducing the use of pesticides and promoting environmentally friendly farming practices.
Methodology / Theory (How to find the solution?)	
Software Tools (What program/software is used for design, coding and simulation?)	ResNet18 include deep learning frameworks like PyTorch or TensorFlow, a large dataset of images of healthy and diseased plant samples, pre-trained ResNet18 architecture, image preprocessing tools such as OpenCV and Pillow, high-performance computing infrastructure, and evaluation metrics.
Test / Experiment How to test and characterize the design/prototype?	The dataset include multiple plant species, such as tomato, grape, orange, soybean, squash, potato, corn (maize), and strawberry, as mentioned.After collecting the dataset, the ResNet18 machine learning model is fine-tuned with the new data to create a more accurate model for plant disease detection.In this model we are using 80% Data as testing training purpose and rest of them for test
Simulation/Test Data (What parameters are determined?)	In This Paper there is almost dataset of 4,122 images.
Result / Conclusion (What was the final result?)	ResNet18 is a popular deep learning architecture for image classification that uses skip connections to make training easier and improve performance. It has been applied successfully to plant disease detection, achieving high accuracy on various crops. One study achieved 97.53% accuracy in detecting tomato diseases, while another achieved 98.68% on grapevine diseases. Our own implementation using ResNet18 achieved the highest accuracy to date, with 99.6%. Validation loss is an important metric for detecting overfitting during training.
Obstacles/Challenges (List the methodological obstacles if authors mentioned in the article)	There was no Challenges Found
Terminology (List the common basic words frequently used in this research field)	CNN , ResNet18, plant disease, ML, high accuracy.

Review Judgment (Briefly compare the objectives and results of all the articles you reviewed)	• "Detection and Classification of Citrus Leaf Diseases Using Transfer Learning and Ensemble Techniques" had accuracy of 99.21% in distinguishing between healthy and diseased leaves using transfer learning and an ensemble of ResNet50. • "Deep Learning-Based Tomato Plant Disease Detection Using Multiple Data Augmentation Techniques" had 99.36% of accuracy using ResNet50 and data augmentation techniques such as rotation, zoom
Review Outcome (Make a decision how to use/refer the obtained knowledge to prepare a separate and new methodology for your own research project)	This paper can help me for further research in this area, this paper can identify research gaps and challenges. This information can be used for me as a guide for developing my own crop disease identification models.Which will be very helpful on identifying and give treatment to the plant