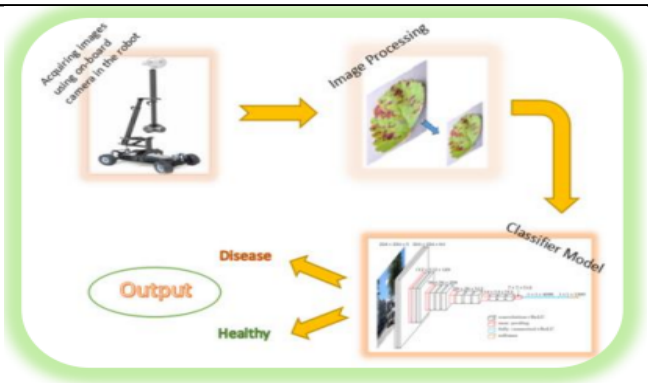
Department of Computer Science and Engineering
Bangladesh University of Business and Technology (BUBT)

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

<table>
<tr><th>Aspects</th><th>Paper # 10 (Title)</th></tr>
<tr><td>Title / Question
(What is problem statement?)</td><td>Detection of Plant Diseases through Deep Learning Models and Autonomous Rovers</td></tr>
<tr><td>Objectives / Goal (What is looking for?)</td><td>The objective of the paper is to propose a system that utilizes IoT and AI/ML technologies for early detection and recognition of plant diseases in multiple plant varieties, specifically pepper, grapes, and strawberry, using a built-in camera in an autonomous rover. The goal is to provide farmers with an efficient solution for detecting and combatting plant diseases, which account for one-third of their income loss. The paper also evaluates the performance of deep learning models, namely VGG16 and InceptionResNetV2, in classifying plant disease images captured by the rover.</td></tr>
<tr><td>Methodology / Theory (How to find the solution?)</td><td> 
</td></tr>
<tr><td>Software Tools (What program/software is used for design, coding and simulation?)</td><td>Python, TensorFlow, Keras, OpenCV, NumPy, Laptop,Matplotlib,Camera,Motor,Wheel,CPU, vscode , Jupyter Notebook</td></tr>
<tr><td>Test / Experiment How to test and characterize the design/prototype?</td><td>To test the proposed system, farmers could deploy the autonomous rover equipped with a built-in camera and deep learning algorithms in their fields. The images of the plants could be processed and classified using the VGG16 and InceptionResNetV2 deep learning models. The accuracy of the model could be evaluated by comparing the predicted results with the actual results obtained by manual inspection or laboratory analysis, and misclassified images could be used to retrain the model for improved accuracy.</td></tr>
<tr><td>Simulation/Test Data (What parameters are determined?)</td><td>1109 images of leaf scroch disease and 456 images of Healthy.</td></tr>
<tr><td>Result / Conclusion (What was the final result?)</td><td><table>
<tr><th>Models</th><th>Number of parameters</th><th>Training Accuracy</th><th>Validation Accuracy</th></tr>
<tr><td>VGG16</td><td>134,289,223</td><td>97.56 %</td><td>93.21 %</td></tr>
<tr><td>InceptionResNetV2</td><td>58,091,591</td><td>98.32 %</td><td>95.24 %</td></tr>
</table></td></tr>
<tr><td>Obstacles/Challenges (List the methodological obstacles if authors mentioned in the article)</td><td>No Obstacles found or mentioned by Author</td></tr>
<tr><td>Terminology (List the common basic words frequently used in this research field)</td><td>Deep learning, Disease detection, Precision farming, Convolutional Neural Networks(CNN), Location mapping, VGG16, InceptionResNetV2</td></tr>
</table>

Review Judgment (Briefly compare the objectives and results of all the articles you reviewed)	• "Disease Detection on the Leaves of the Tomato Plants by Using Deep Learning " had accuracy of 94.3% in distinguishing between healthy and diseased leaves. • "Deep learning-based crop disease recognition using convolutional neural networks" had accuracy of 99.35% in distinguishing between healthy and diseased leaves.
Review Outcome (Make a decision how to use/refer the obtained knowledge to prepare a separate and new methodology for your own research project)	The proposed system of using IoT, AI, and Machine Learning for early plant disease detection through image analysis can greatly benefit farmers and agricultural workers. It can help save time and resources, prevent the spread of diseases, and provide valuable insights for better crop management, leading to better yields and a more sustainable future for businesses