# V Y S Gowtham

CB.EN.U4CSE21166

# <<Quiz: >>

|  |  |
| --- | --- |
| Continuous Assessment Theory (CAT) - Quiz 1 (CO1 & CO2) | 4 Mark |
| One Quiz (or) All google badge |  |

# <<Google badge with Date:>>

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

|  |  |
| --- | --- |
| Continuous Assessment Theory (CAT) - Assignment (CO2) | 6 Marks |
| One workshop on a new technology = Installation + Intro + 5 programs (or) 1 app |  |

<<Technology Title: >>

<<Remarks:>>

# <<Project Title: >> Potato Leaf Disease Detection

<Team Number: >> 14

<<Student name:>> V Gowtham

<<Register Number:>> CB.EN.U4CSE21166

<<Student name:>> U Jaswanth

<<Register Number:>> CB.EN.U4CSE21164

# <<Base paper that supports your proposed project>> [Submitted: Y / N] Y

1. <<Title and DOI of the paper>> Y

Potato Plant Leaves Disease Detection and Classification using Machine Learning Methodologies

DOIlink: <https://iopscience.iop.org/article/10.1088/1757-899X/1022/1/012121/pdf>

1. <<Title and DOI of the paper>> Y

Applications of Computer Vision on Automatic Potato Plant Disease Detection: A Systematic Literature Review

DOI Link: <https://onlinelibrary.wiley.com/doi/epdf/10.1155/2022/7186687>

3.<<Title and DOI of the paper>> Y

An Artificial Intelligence Framework for Disease Detection in Potato Plants

DOI Link: <https://etasr.com/index.php/ETASR/article/view/6456/3412>

# <<Problem you are trying to solve and their significance>> [300 – 500 words only]

The problem we are addressing is the detection of potato leaf diseases using Convolutional Neural Networks (CNNs) in real-world agricultural environments. The challenge lies in how variable conditions—such as lighting, camera angles, and complex backgrounds—can affect the model’s accuracy. These inconsistencies limit the reliability of disease detection systems when deployed for farmers or agricultural workers.

Another issue is the high computational power that CNN models require. While CNNs are highly effective at image recognition tasks, they demand significant resources, making them difficult to implement on mobile devices or edge systems with limited processing capabilities. This poses a problem, as many farmers depend on smartphones for real-time disease detection in the field.

Moreover, CNNs often function as "black boxes," providing little insight into how they make their predictions. In agriculture, where critical decisions on crop health are at stake, this lack of transparency can create mistrust. Farmers need to understand why a model labels a leaf as diseased or healthy to feel confident in its recommendations.

Scaling these systems for broader agricultural use adds another layer of complexity. Different regions have diverse environmental conditions, and models trained in one region may not perform well in others without significant adaptation, making integration into agricultural workflows a challenge.

Solving this problem is significant because early, accurate detection of potato leaf diseases can help farmers reduce crop losses, improve yields, and use fewer chemicals, promoting more sustainable farming practices. Our proposed solution involves creating a hybrid CNN model that incorporates enhanced data augmentation, attention mechanisms to focus on critical leaf details, real-time optimization for mobile use, and feedback integration to improve performance over time. We are also comparing pretrained models like VGG16, DenseNet201 and EfficientNet based on their accuracy, F1 score, and loss to ensure the best possible model. This approach will create a more effective, interpretable, and practical tool for farmers to use in their everyday work.

<<Dataset used for the Lab evaluation>>

[url: <https://www.kaggle.com/datasets/mohitsingh1804/plantvillage> ]

# <<Lab Evaluation 1>>

|  |  |
| --- | --- |
| Continuous Assessment Lab (CAL) - Lab Eval 1 (CO3 & CO4) | 10 Marks |
| Mobile + Tensor lite ML (2 model) + 5 page report = 1 table + 2 figure + 2 graph |  |
| <<Mobile App progress -10%>> [ \_\_ marks]  << Technology relevant with Mobile applications lab eval: 1 table>> [ \_\_ marks]  <<Existing Model: 1 figure>> [ \_\_ marks]  <<Experiment: Training and Testing>> [ \_\_ marks]  <<Results: At least 2 graph with suitable metrics>> [ \_\_ marks]  <<Remark>>  <<Document submitted / uploaded>>  **<<Lab Evaluation 2>>** |  |
| Continuous Assessment Lab (CAL) - Lab Eval 2 (CO3 & CO4) | 10 Marks |
| Mobile + 1 new model + 5-page report = 1 table + 2 figure + 2 graph |  |
| <<Mobile App progress -10 - 50%>> [ \_\_ marks]  << Compare your project to similar (or) relevant app: 1 table>> [ \_\_ marks]  <<New Model: 1 figure>> [ \_\_ marks]  <<Experiment: Training and Testing>> [ \_\_ marks]  <<Results: At least 2 graph with suitable metrics>> [ \_\_ marks]  <<Remarks>>  <<Document submitted / uploaded>>  **<<Final Evaluation>>** |  |
| Continuous Assessment Lab (CAL) - Project (CO3 - CO5) | 10 Marks |
| 5-page Presentation + 5 page report = 1 table + 2 figure + 2 graph |  |

<<Mobile App progress -50- 100%>> [ \_\_ marks]

<< Compare all the models: 1 table>> [ \_\_ marks]

<<Application Architecture: 1 figure>> [ \_\_ marks]

<<Experiment: Training and Testing>> [ \_\_ marks]

<<Results: At least 2 graph with suitable metrics>> [ \_\_ marks]

<<Remarks>>

<<Document submitted / uploaded>>

# <<Continuous Lab Evaluation>>

|  |  |
| --- | --- |
| Continuous Assessment Lab (CAL) - Android Certification from Google (CO1 - CO5) | 10 Marks |
| Badges + Certification = FULL marks if certificate submitted on time |  |
| << Title: >> Introduction to Android Mobile Application Development  <<Remarks: Attach certificate>>    **<<Midterm Evaluation>>** |  |
| Mid Term (CO1- CO4) | 20 Marks |
| 20 theory (4 x 5 marks questions) + 30 lab program (2 x 15 marks question = 5 code + 5 output + 5 viva) |  |
| **<<End semester Evaluation>>** |  |
| End Semester Exam (CO1- CO5) | 30 Marks |
| 40 theory (4 x 8 marks questions) + 60 lab program (2 x 30 marks question = 10 code + 10 output + 10 viva) |  |