National College of Ireland

Configuration Manual

MSc Research Project
MSc in Data Analytics

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MSc Project Submission Sheet

School of Computing

Student Name:	Gokul Lala ……
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Programme:	MSc in data analytics **Year:** 2023-2024
Module:	Research Project ……
Lecturer:	Abid Yakoob ……
Submission Due Date:	12/8/2024 ……
Project Title:	Enhancing Guava Fruit Disease Detection and Localization through a Hybrid Vision Transformer and Convolutional Neural Network Architecture ……
Word Count:	55 …… **Page Count:** 3 ……

I hereby certify that the information contained in this (my submission) is information pertaining to research I conducted for this project. All information other than my own contribution will be fully referenced and listed in the relevant bibliography section at the rear of the project.
ALL internet material must be referenced in the bibliography section. Students are required to use the Referencing Standard specified in the report template. To use other author's written or electronic work is illegal (plagiarism) and may result in disciplinary action.

Signature:	GOKUL LALA ……
Date:	12/08/2024 ……

PLEASE READ THE FOLLOWING INSTRUCTIONS AND CHECKLIST

Attach a completed copy of this sheet to each project (including multiple copies)	□
Attach a Moodle submission receipt of the online project submission, to each project (including multiple copies).	□
You must ensure that you retain a HARD COPY of the project, both for your own reference and in case a project is lost or mislaid. It is not sufficient to keep a copy on computer.	□

Assignments that are submitted to the Programme Coordinator Office must be placed into the assignment box located outside the office.

Office Use Only	
Signature:	
Date:	
Penalty Applied (if applicable):	

Configuration Manual

Forename Surname
Student ID:

1 Google colab setup

- 1.1 Access Google Colab:
  - Open your web browser and go to https://colab.research.google.com
  - Sign in with your Google account if you haven't already
- 1.2 Create a new notebook:
  - On the Colab homepage, click on "New notebook" or go to File > New notebook
  - Alternatively, to upload an existing notebook:
  - Click on "File" > "Upload notebook"
  - Select your .ipynb file from your local machine
- 1.3 Set up the runtime environment:
  - Click on "Runtime" in the top menu
  - Select "Change runtime type"
  - In the pop-up window, set the following:
    - Hardware accelerator: GPU
    - GPU type: T4 (if available)
    - Click "Save"

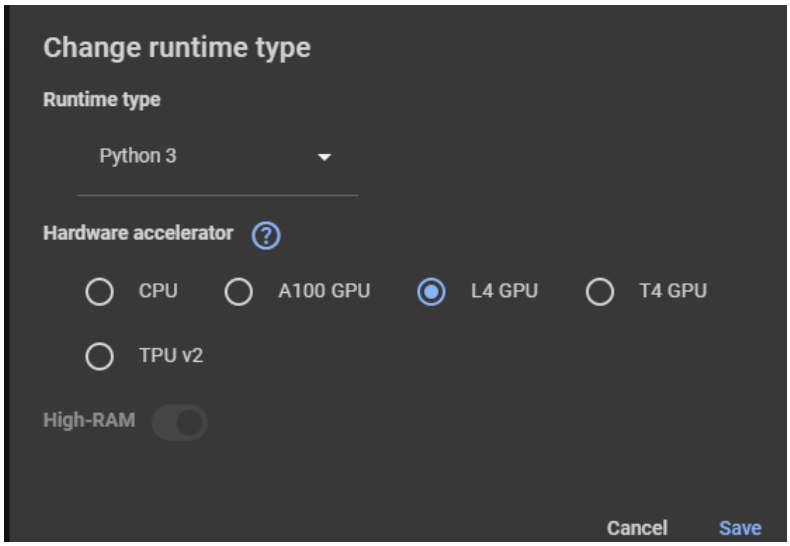


Figure 1 Changing runtime

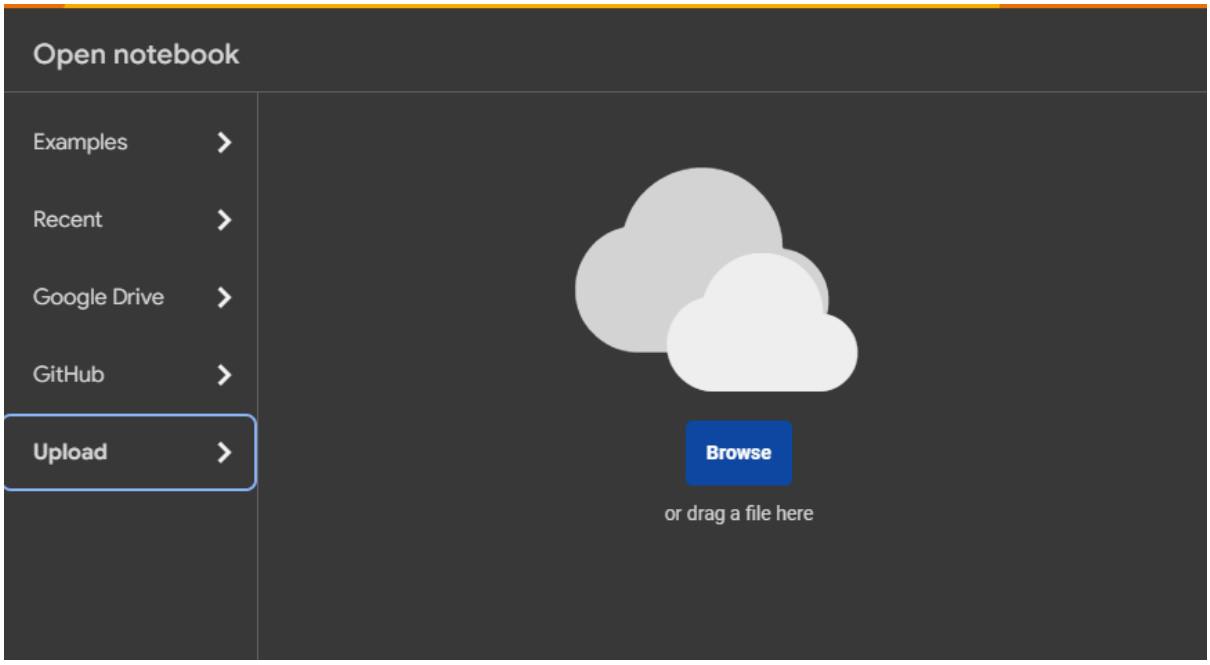


Figure 2 Upload the notebook

2 Upload the Model file into Google drive

- Upload the model file to the google drive

- Upload the model file into google drive and then run the following in the notebook to mount the drive

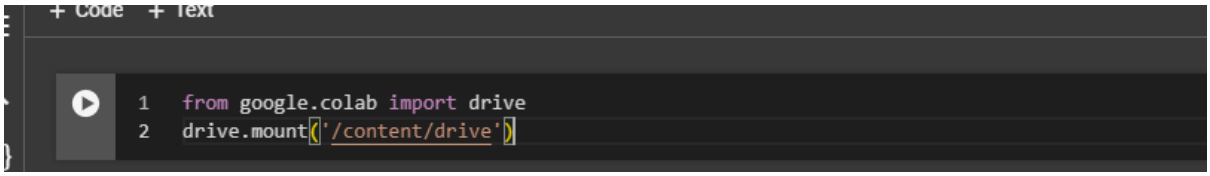
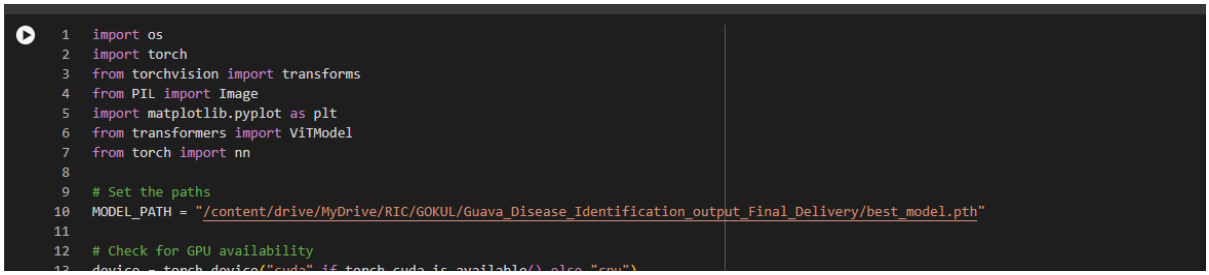


Figure 3 Run this cell to mount the google drive

3 INFERENCE

Change model path here according to current directory.



Change the image path for classification here

```python
# Main execution
def main():
    # Define the classes (make sure this matches the order used during training)
    classes = ['Canker', 'Dot', 'Healthy', 'Mummification', 'Phytopthora', 'Red', 'Root Styler', 'Rust', 'Scab'] # Update this list based on your actual classes

    # Load the model
    model = load_model(MODEL_PATH, len(classes))

    # Path to your custom image
    custom_image_path = "/content/drive/MyDrive/RIC/GOKUL/Guava_Disease_Identification/valid/Scab/Scab-103-_jpg.rf.469810b1505e5e18f8ed8749dd52859e.jpg"  # Update this path

    # Preprocess the image
    image_tensor = preprocess_image(custom_image_path)

    # Perform inference
    prediction, probabilities = predict(model, image_tensor, classes)

    # Print the results
    print(f"Predicted class: {prediction}")
    for cls, prob in zip(classes, probabilities):
        print(f"{cls}: {prob:.4f}")

    # Visualize the prediction
    visualize_prediction(custom_image_path, prediction, probabilities, classes)

if __name__ == "__main__":
    main()
```

4 Sample outputs

```
Using device: cpu
Some weights of ViTModel were not initialized from the model checkpoint at google/vit-base-patch16-224 and are newly initialized: ['vit.pooler.dense.bias', '
You should probably TRAIN this model on a down-stream task to be able to use it for predictions and inference.
Predicted class: Scab
Canker: 0.0675
Dot: 0.0461
Healthy: 0.1547
Mummification: 0.0798
Phytopthora: 0.0181
Red: 0.0141
Root Styler: 0.0196
Rust: 0.0806
Scab: 0.5195
```

References

Huo, Y., Jin, K., Cai, J., Xiong, H., & Pang, J. (2023). *Vision Transformer (ViT)-based Applications in Image Classification*. https://doi.org/10.1109/bigdatasecurity-hpsc-ids58521.2023.00033

Howlader, M. R., Habiba, U., Faisal, R. H., & Rahman, M. M. (2019). *Automatic Recognition of Guava Leaf Diseases using Deep Convolution Neural Network*. https://doi.org/10.1109/ecace.2019.8679421

Google Colab. (n.d.). https://colab.research.google.com/