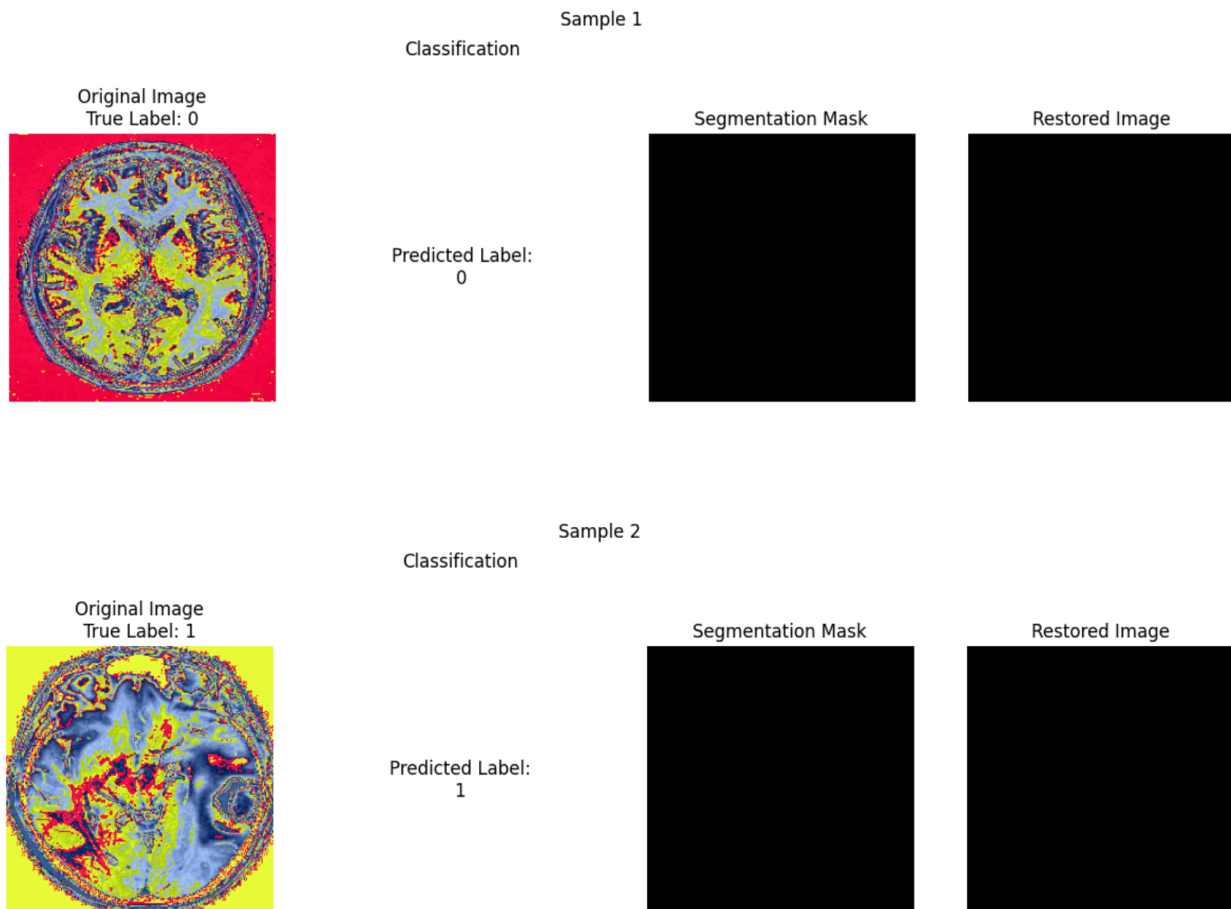


Mini project

Mamba Architecture

Kavya Reddy
700759486

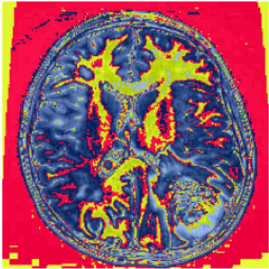
Results:



Explanation:

This code defines a function called `show_results` to visualize the outputs of a model performing classification, segmentation, and restoration tasks on several sample images from the validation dataset. The function puts the model into evaluation mode and processes each image to generate four views: the original input image, the predicted classification label, a binary segmentation mask, and a restored version of the image. The images and outputs are displayed side-by-side using matplotlib, allowing us to easily review the model's performance on each task. We use `torchvision` transformations to format the images for clear and accurate display.

Original Image
True Label: 1

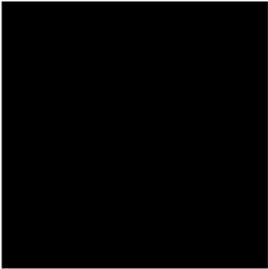


Classification

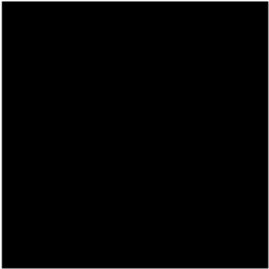
Predicted Label:
1

Sample 3

Segmentation Mask



Restored Image



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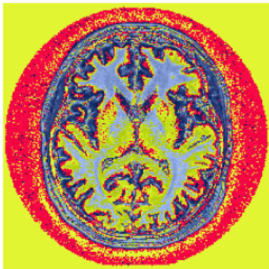
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Original Image
True Label: 0




Classification

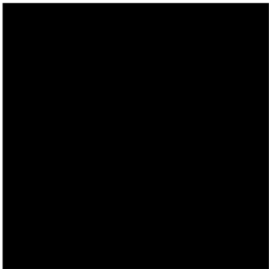
Predicted Label:
0

Sample 4

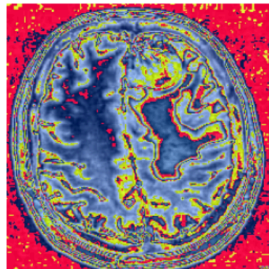
Segmentation Mask



Restored Image



Original Image
True Label: 1




Classification

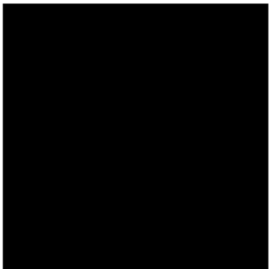
Predicted Label:
1

Sample 5

Segmentation Mask



Restored Image



Classification Results:

Accuracy: 82.35%

Precision: 82.92%

Sensitivity (Recall): 82.35%

F1 Score: 82.35%

Segmentation Results:

Mean IoU: 0.00%

Restoration Results:

Mean MSE: 2.0596

Explanation:

To assess the model's performance on classification, segmentation, and restoration tasks, we began by setting it to evaluation mode and disabling gradient computations to enhance inference speed. For classification, we obtained predictions by selecting the highest-probability class for each input, then calculated accuracy, precision, recall (sensitivity), and F1 score using `sklearn.metrics`, which provided an overall view of the model's classification capabilities.

For segmentation, we calculated the Intersection over Union (IoU) by applying a threshold of 0.5 to the segmentation output and comparing it with a dummy segmentation target (which ideally would be replaced with actual validation targets). The mean IoU score was derived by averaging the IoU values across the validation set. Finally, for restoration, we measured the mean squared error (MSE) between the model's output and the original images to evaluate reconstruction accuracy. Each metric was then displayed to summarize the model's effectiveness on each task.