

IMAGE SEGMENTATION MODEL: **TECHNICAL REPORT**

Objective:

The goal of this project is to create an image segmentation model that accurately segments different regions within images using a machine learning or deep learning approach.

Dataset:

For this project, the COCO dataset was used. The dataset includes various everyday objects, providing a comprehensive set of images for segmentation tasks.

Model Development:

A UNet model was selected for the segmentation task due to its effectiveness in biomedical image segmentation and its ability to handle diverse segmentation problems.

Steps Taken:

1. Data Preparation:

- The COCO dataset was loaded, and images were resized to 128x128 for consistency.
- A simulated set of segmentation masks was used for demonstration.

2. Model Architecture:

- The UNet model was designed with several convolutional and upsampling layers to effectively segment images.

3. Training:

- The model was trained for 10 epochs with a batch size of 32.
- Training and validation data were split using an 80-20 ratio.

4. Evaluation:

- The model was evaluated using validation data.
- Metrics used: Accuracy and Binary Cross-Entropy Loss.

Results:

The model achieved a validation accuracy of approximately 50%, indicating room for improvement with real segmentation masks and further tuning of hyperparameters.

Conclusion:

This project showcases a basic implementation of an image segmentation model using the U-Net architecture. With more time and real segmentation masks, the model's performance can be significantly enhanced.

