

# AAI3001 Small Project Report

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## Student Information

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## Files Submitted

- Model Folder: Contains the weights of the chosen model.
- Log Folder: Contains the log data during the training and validation process.
- pkl Folder: Contains all the pickle files used to store the training and validation loss data.
- Task1.py: Contains the code for Task 1.
- Task2.py: Contains the code for Task 2.
- Utils.py: Contains the code for the utility functions used in the project.
- PlotLoss.py: Contains the code for plotting the loss curves.
- Task1.png: Plot for Task 1 with 15 epochs.
- Task2.png: Plot for Task 2 with 10 epochs.

## Model Configuration

The following section provides details about the setting used to define the last layer in the model.

## Task 1 ResNet50 Multi-Class

```
1
2 class Model(torch.nn.Module):
3     def __init__(self, num_classes, weights=None):
4         super(Model, self).__init__()
5         self.model = resnet50(weights=weights)
6
7         num_features = self.model.fc.in_features
8         self.model.fc = torch.nn.Linear(num_features, num_classes)
9
10    def forward(self, x):
11        x = self.model(x)
12        return x
13
```

Listing 1: Task 1 Model Class

## Task 2 ResNet50 Multi-Label

```
1 class MultiLabelModel(torch.nn.Module):
2     def __init__(self, num_classes, weights=None):
3         super(MultiLabelModel, self).__init__()
4         self.model = resnet50(weights=weights)
5
6         num_features = self.model.fc.in_features
7         self.model.fc = torch.nn.Linear(num_features, num_classes)
8
9     def forward(self, x):
10        x = self.model(x)
11        return torch.sigmoid(x)
```

Listing 2: Task 2 Model Class

## Experimental Parameters

The experimental parameters used for training the model are as follows:

- Learning Rate: 0.1, 0.01
- Batch Size: 32
- Seed Values: 0 - using `torch.manual_seed(0)`
- Num Workers: 4 - Specified in the dataloader
- Epochs: 15 (Task 1) and 10 (Task 2)
- Optimiser Momentum: 0.9

These parameters are necessary to reproduce the training process accurately.

## Train/Validation Loss Curves

The following figures show the training and validation loss curves for the specified model setting:

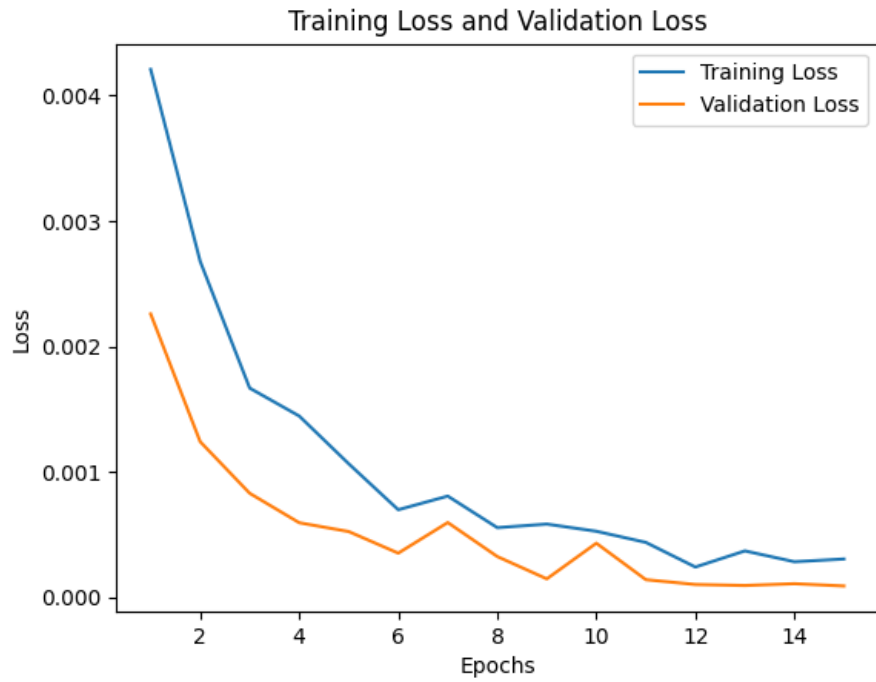


Figure 1: Task 1 (ResNet50 Multi-Class) - Learning Rate 0.01 Augmentation 0

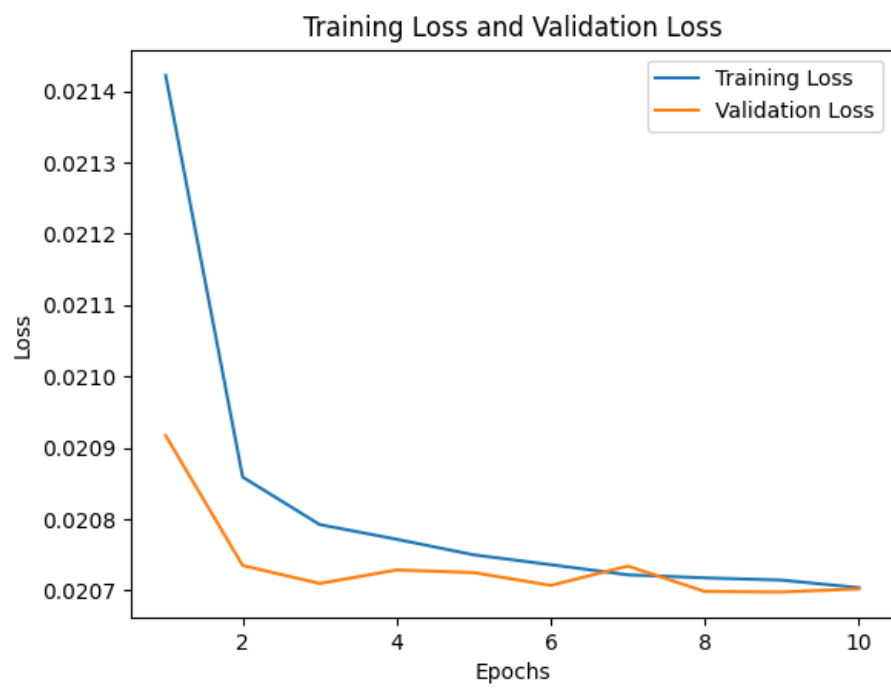


Figure 2: Task 2 (ResNet50 Multi-Label) - Learning Rate 0.01