

Mini Project

ISB46703 - PRINCIPLES OF ARTIFICIAL INTELLIGENCE

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Domain - Bear Subspecies



Grizzly Bear



American Black Bear



Sloth Bear



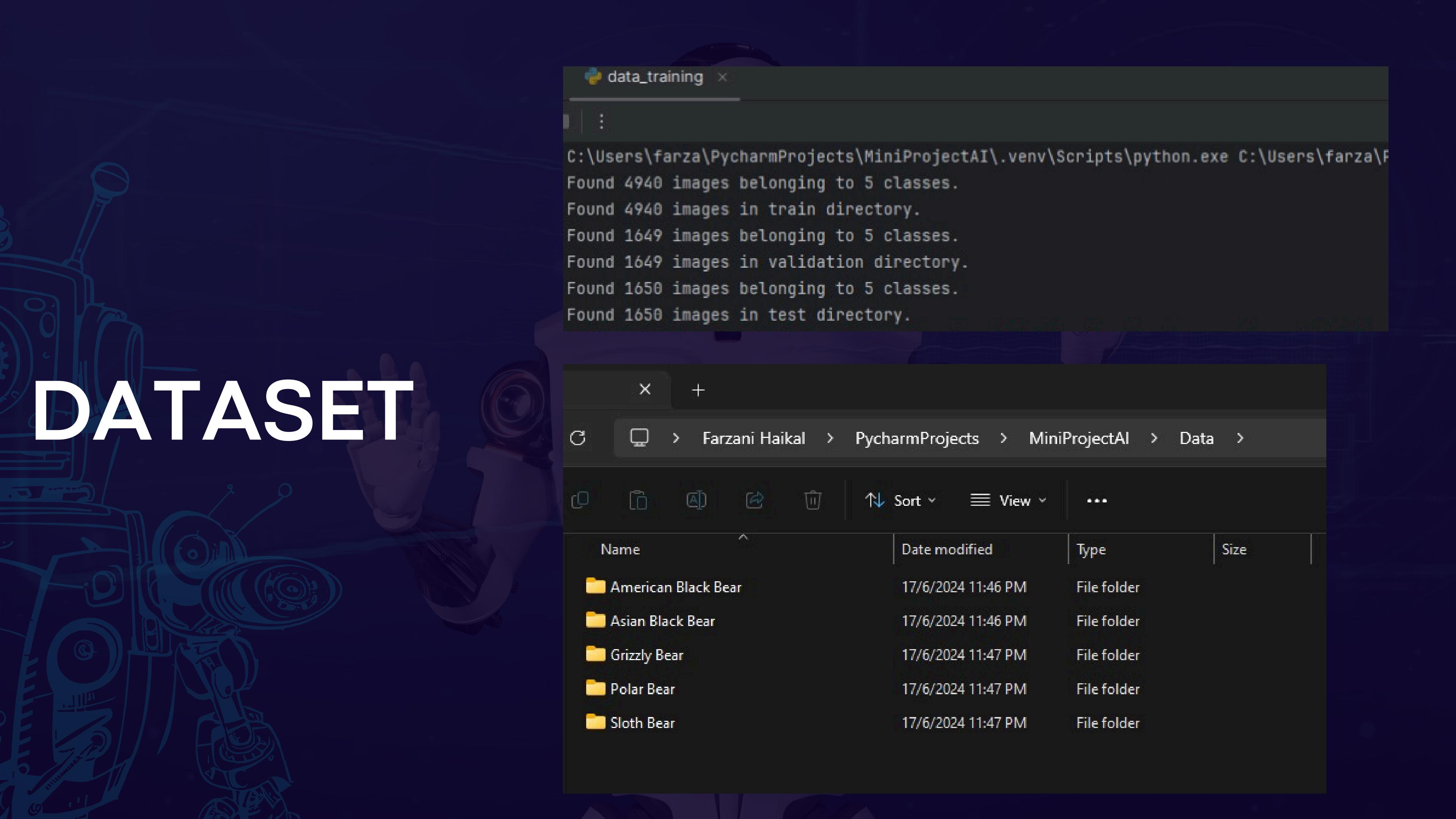
Asian Black Bear



Polar Bear

DATASET

```
data_training x
C:\Users\farza\PycharmProjects\MiniProjectAI\.venv\Scripts\python.exe C:\Users\farza\PycharmProjects\MiniProjectAI\data.py
Found 4940 images belonging to 5 classes.
Found 4940 images in train directory.
Found 1649 images belonging to 5 classes.
Found 1649 images in validation directory.
Found 1650 images belonging to 5 classes.
Found 1650 images in test directory.
```



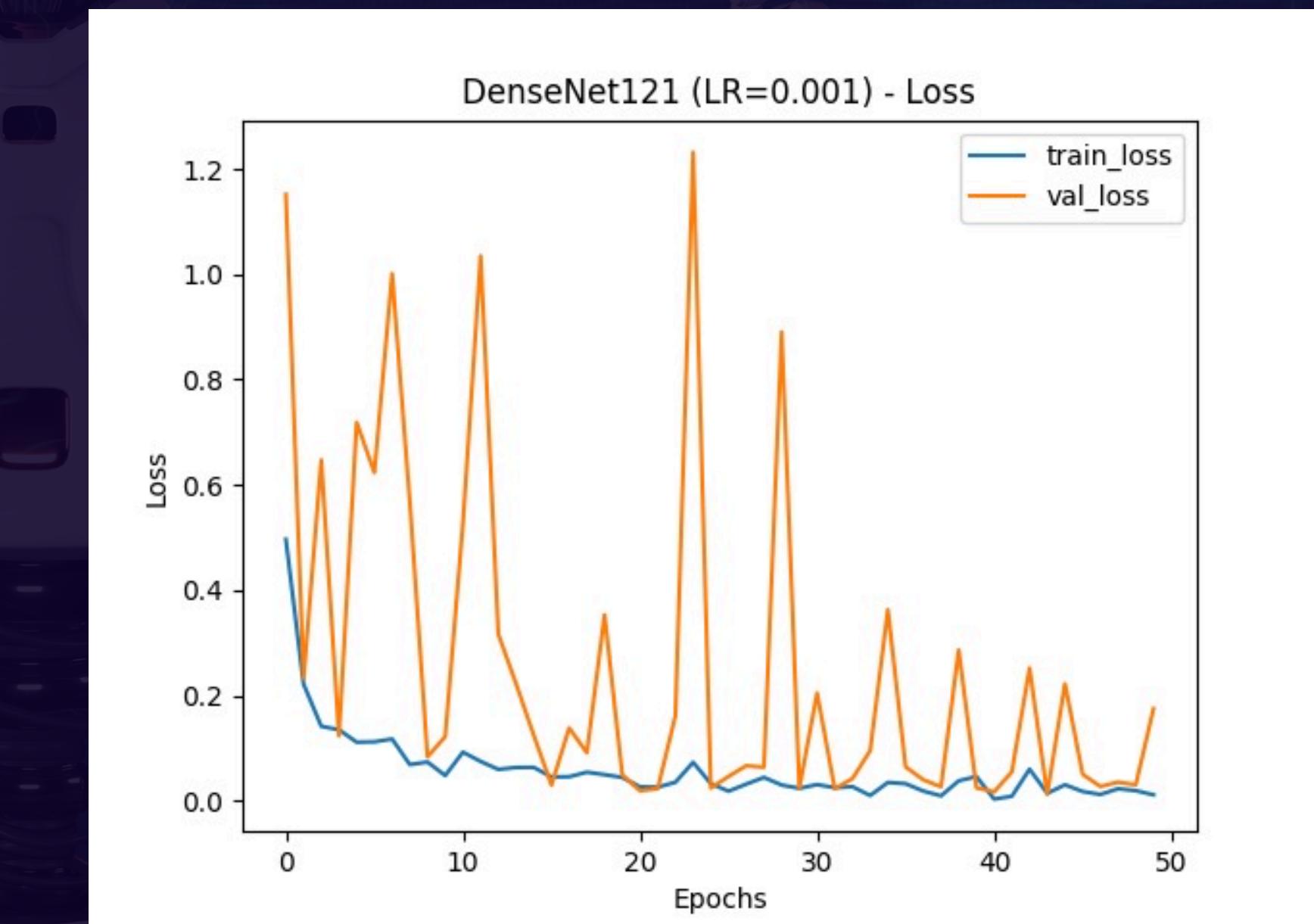
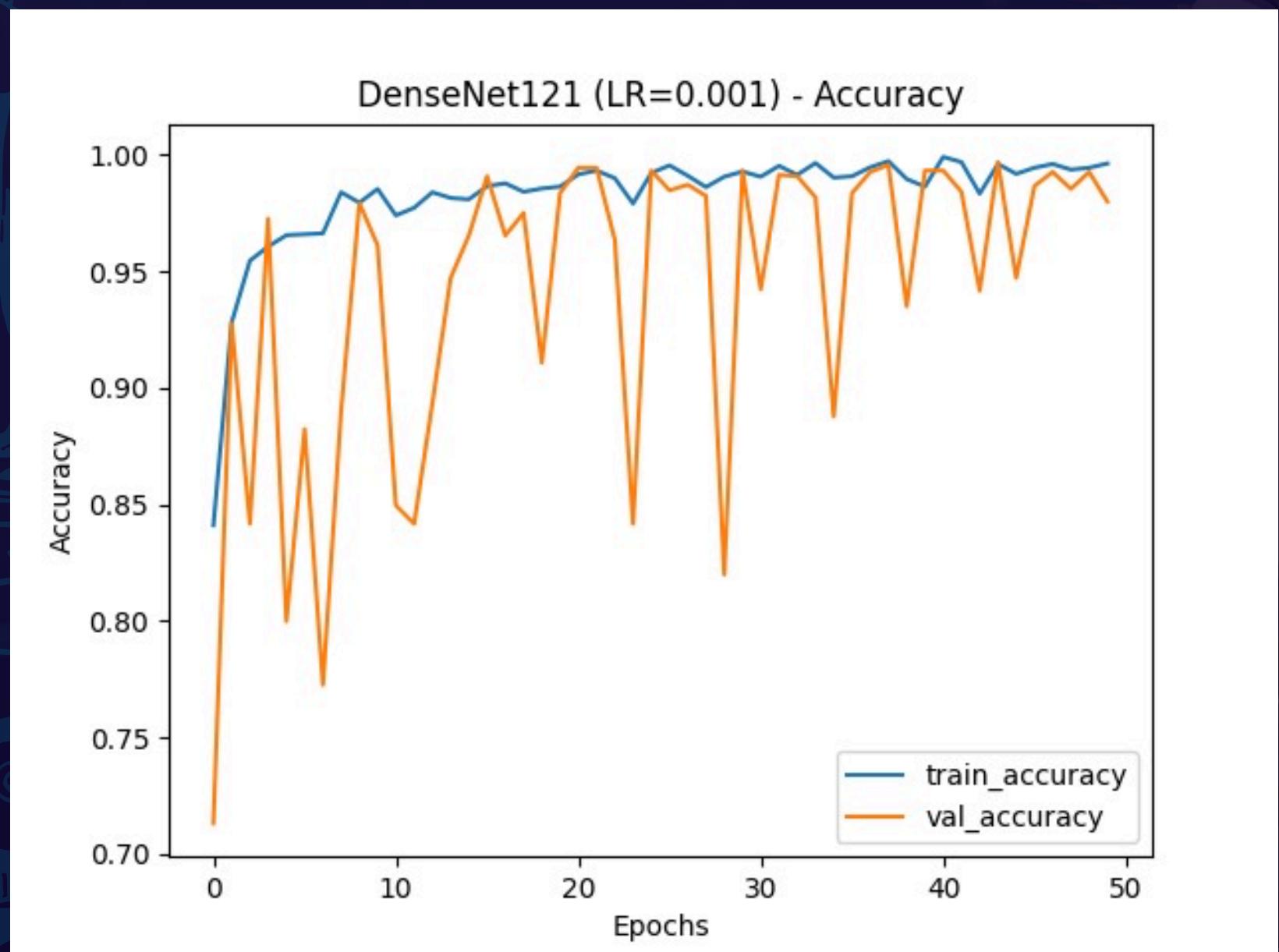
A screenshot of a Windows File Explorer window showing a folder structure. The path is C:\Farzani Haikal\PycharmProjects\MiniProjectAI\Data. The folder contains five subfolders: American Black Bear, Asian Black Bear, Grizzly Bear, Polar Bear, and Sloth Bear, all of which are file folders created on 17/6/2024 at 11:46 PM or 11:47 PM.

Name	Date modified	Type	Size
American Black Bear	17/6/2024 11:46 PM	File folder	
Asian Black Bear	17/6/2024 11:46 PM	File folder	
Grizzly Bear	17/6/2024 11:47 PM	File folder	
Polar Bear	17/6/2024 11:47 PM	File folder	
Sloth Bear	17/6/2024 11:47 PM	File folder	

DenseNet121 - Learning Rate 0.001

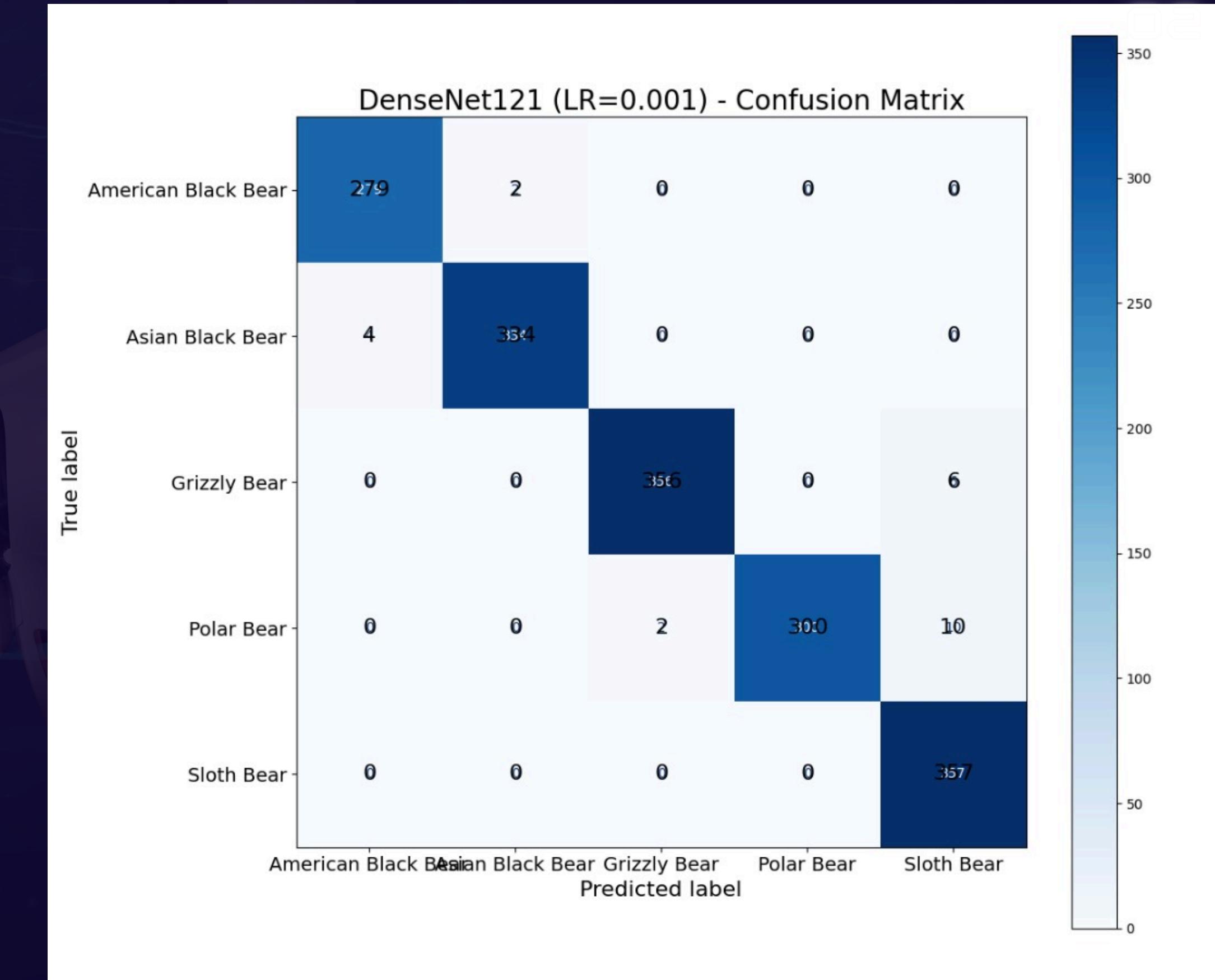
Accuracy

Loss



DenseNet121

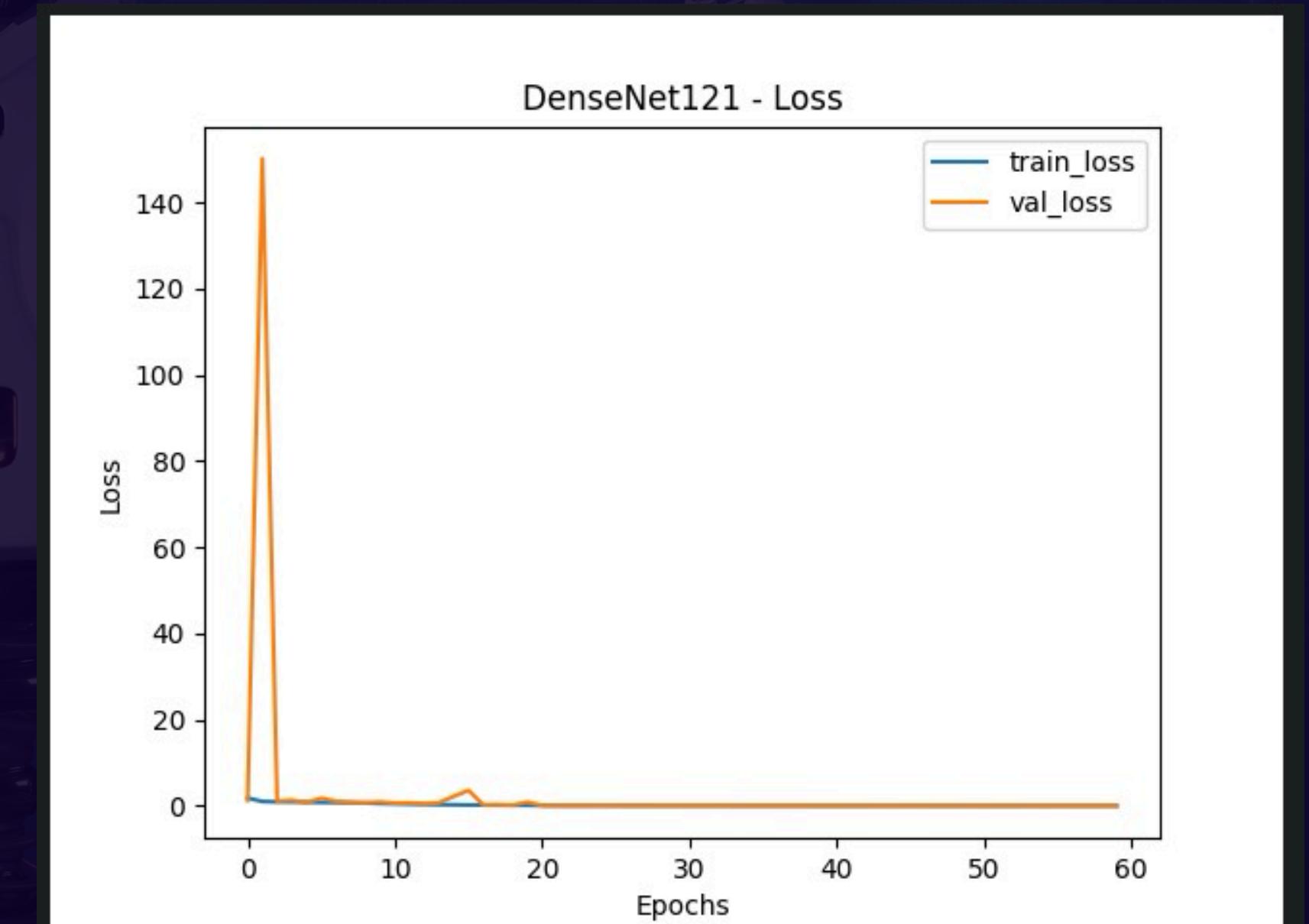
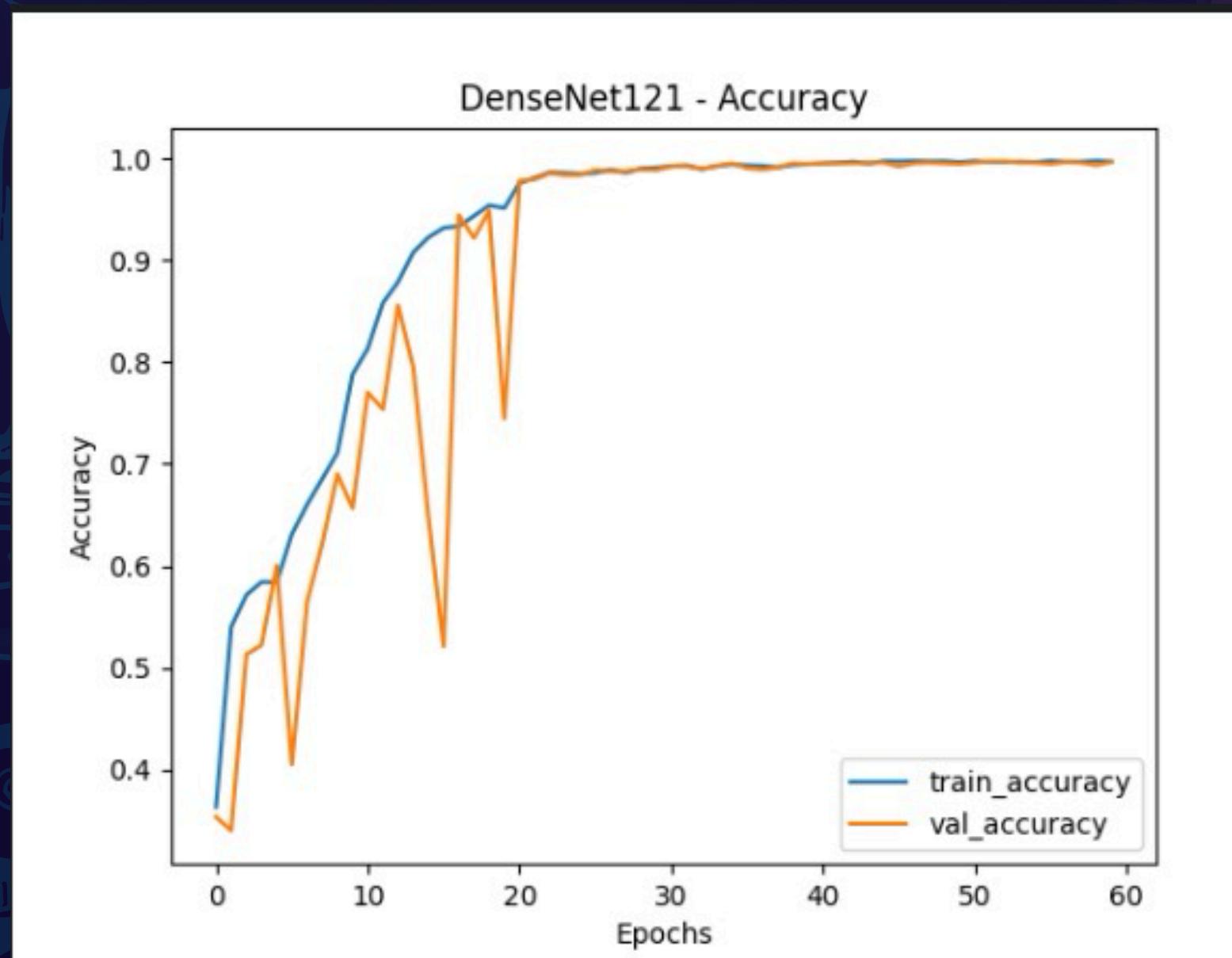
Confusion Matrix



DenseNet121 - Schedule Learning Rate (0.01, 0.001, 0.0001)

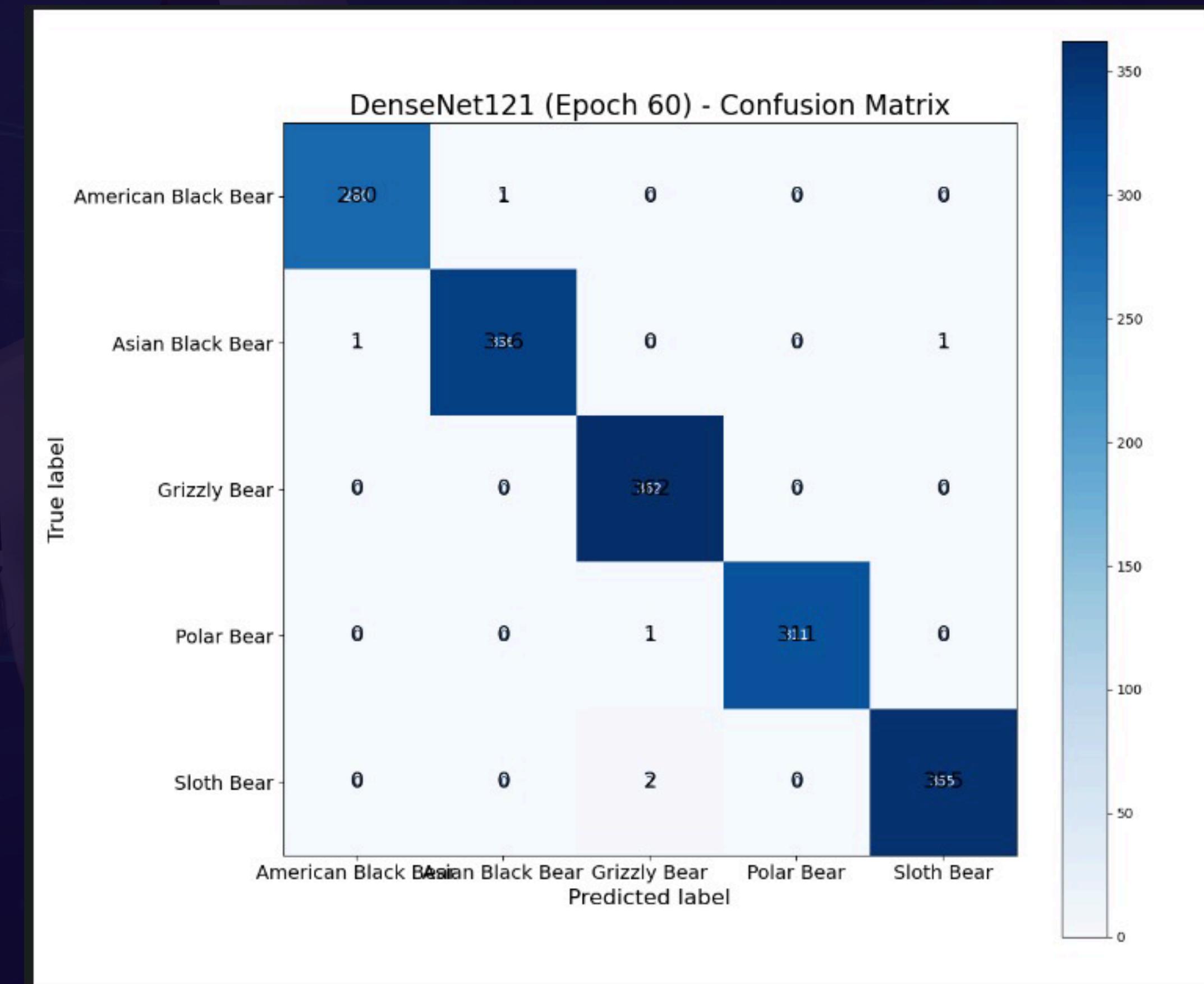
Accuracy

Loss



DenseNet121

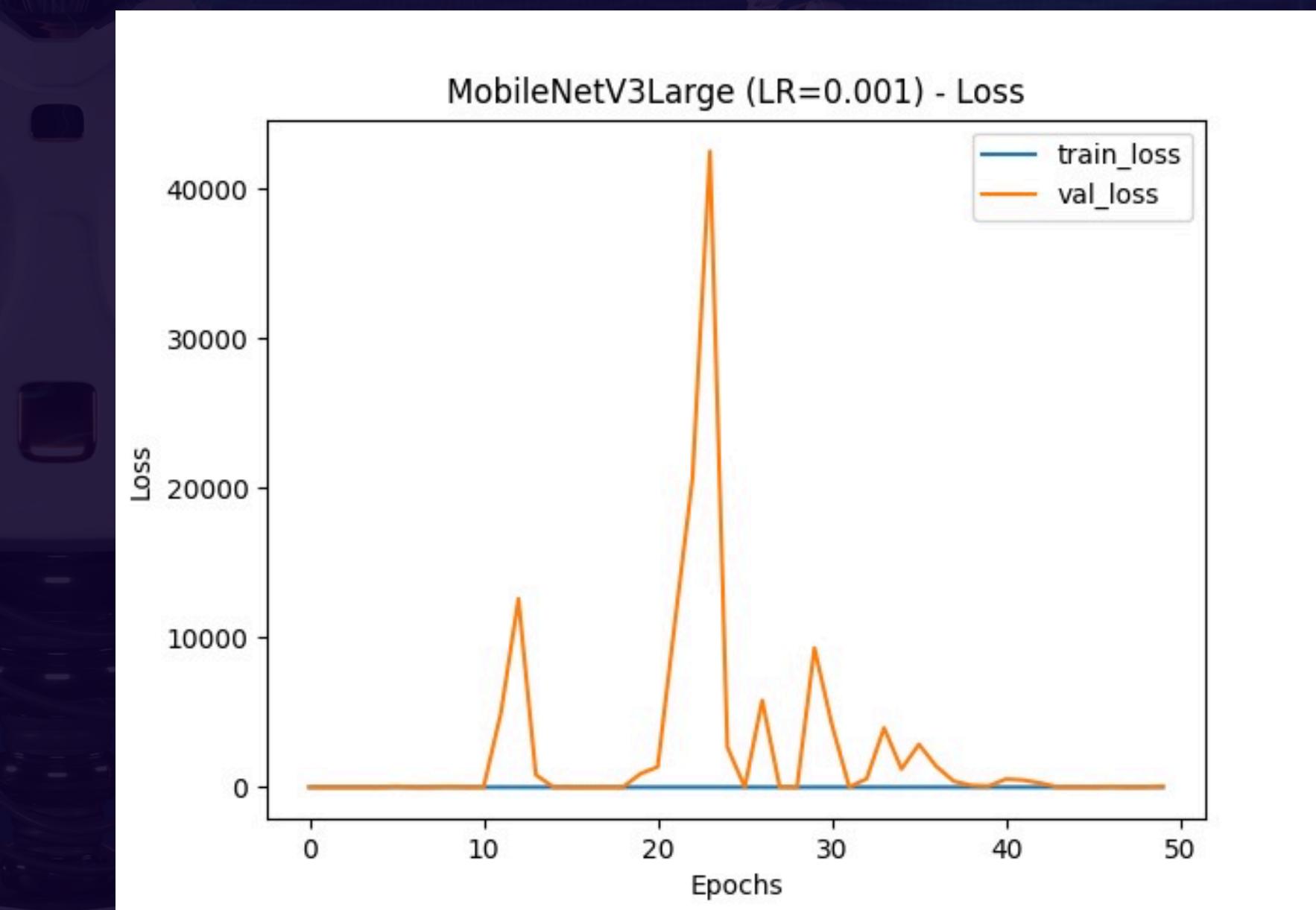
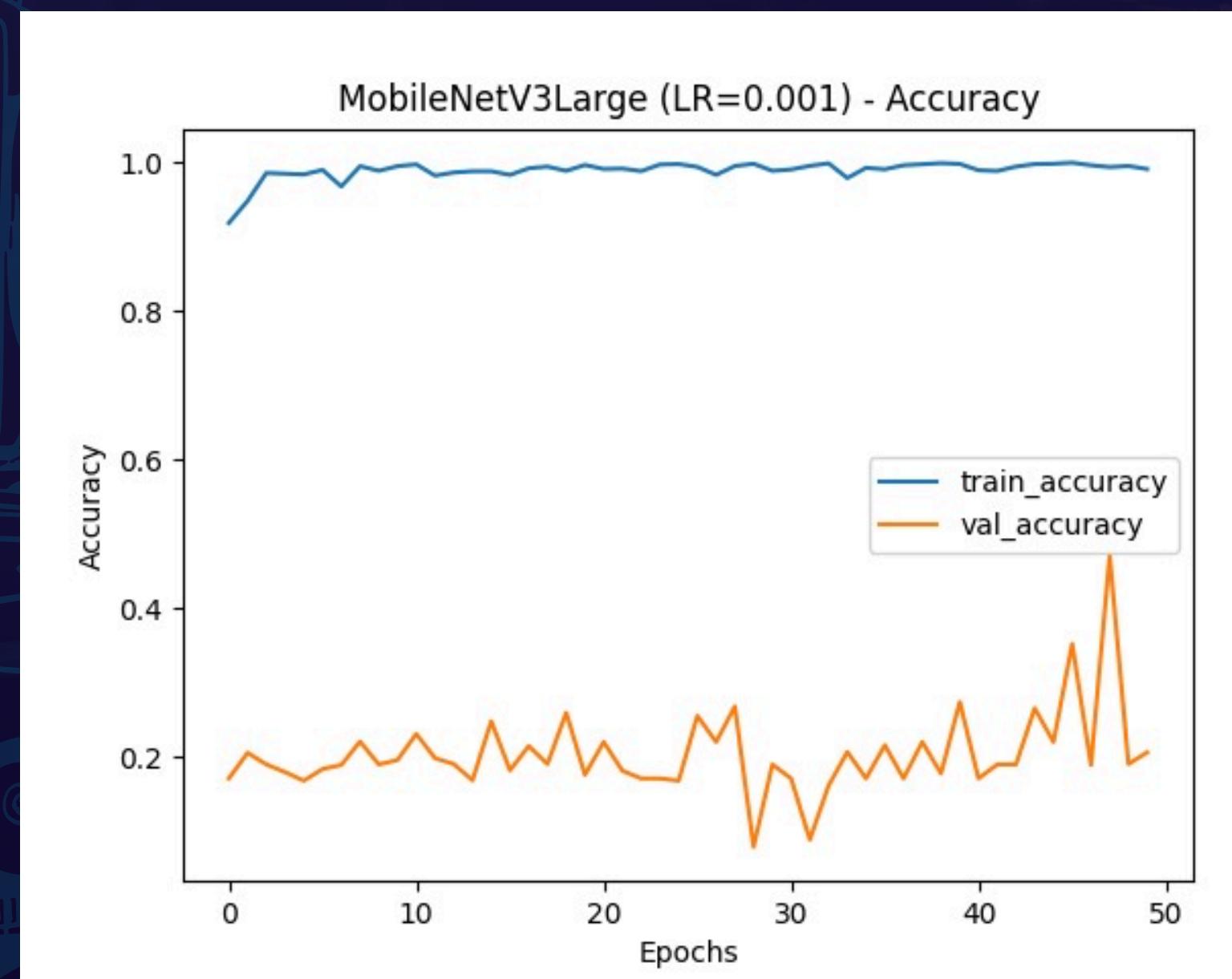
Confusion Matrix



MobileNetV3Large - 50 Epoch

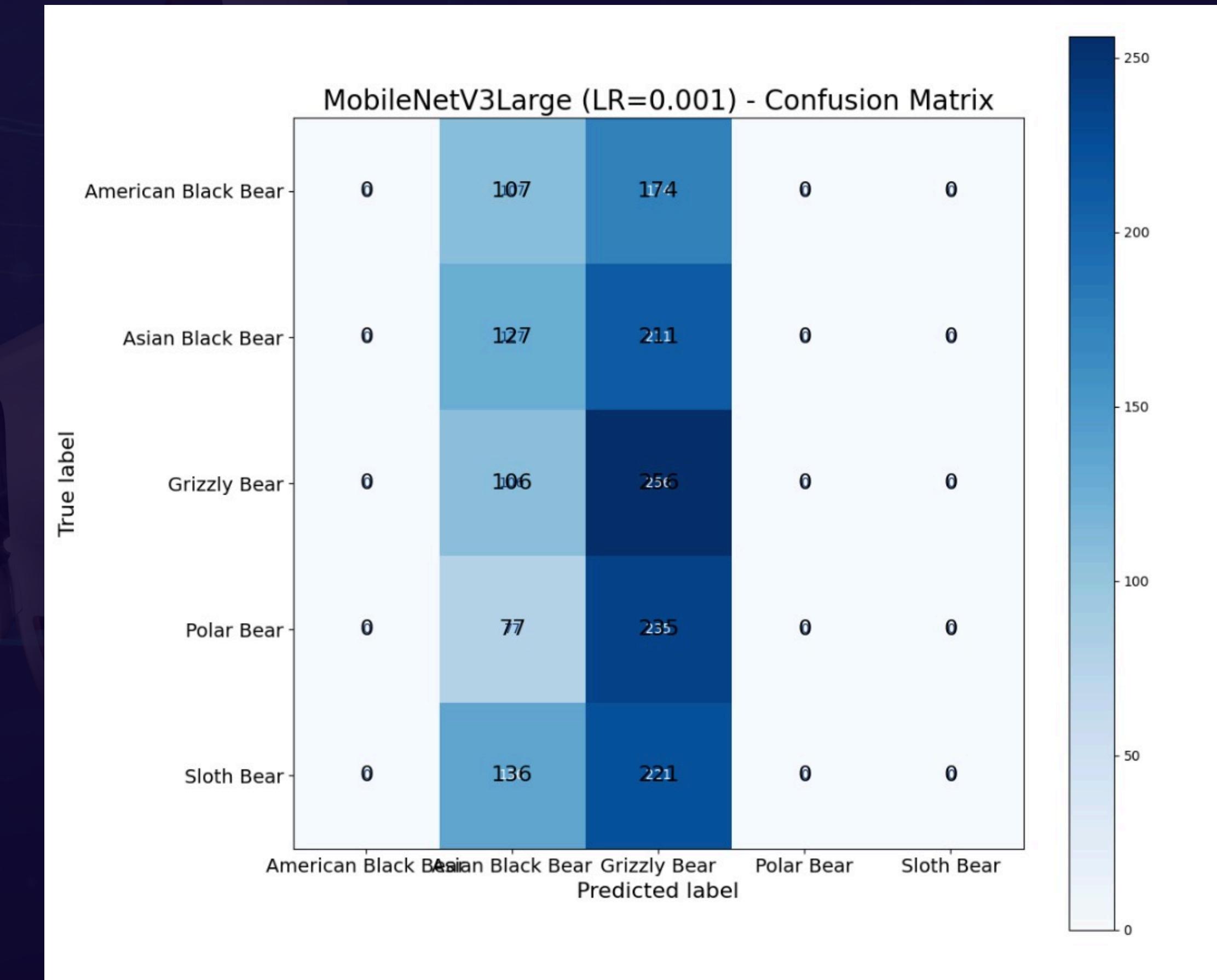
Accuracy

Loss



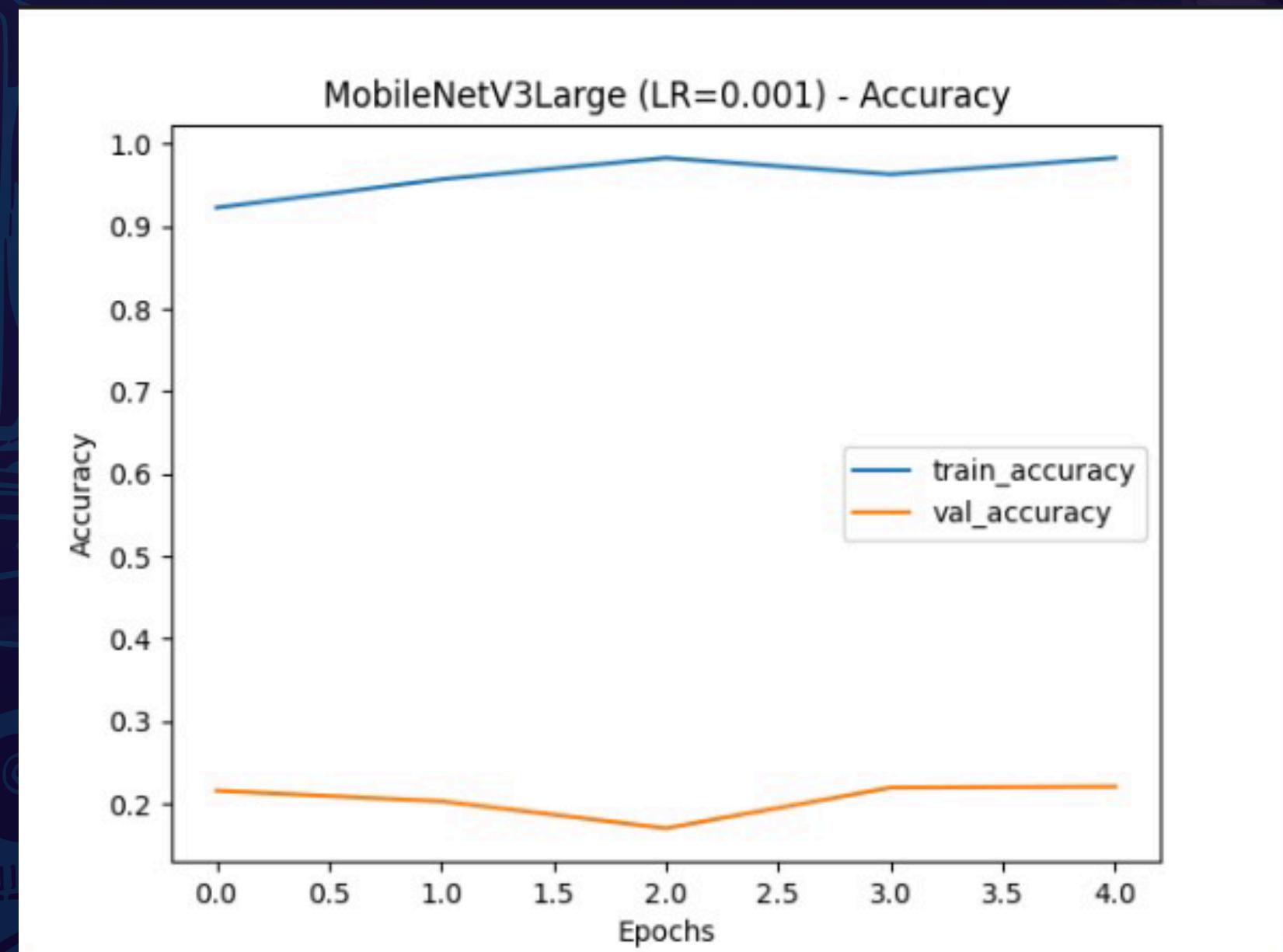
MobileNetV3Large

Confusion Matrix

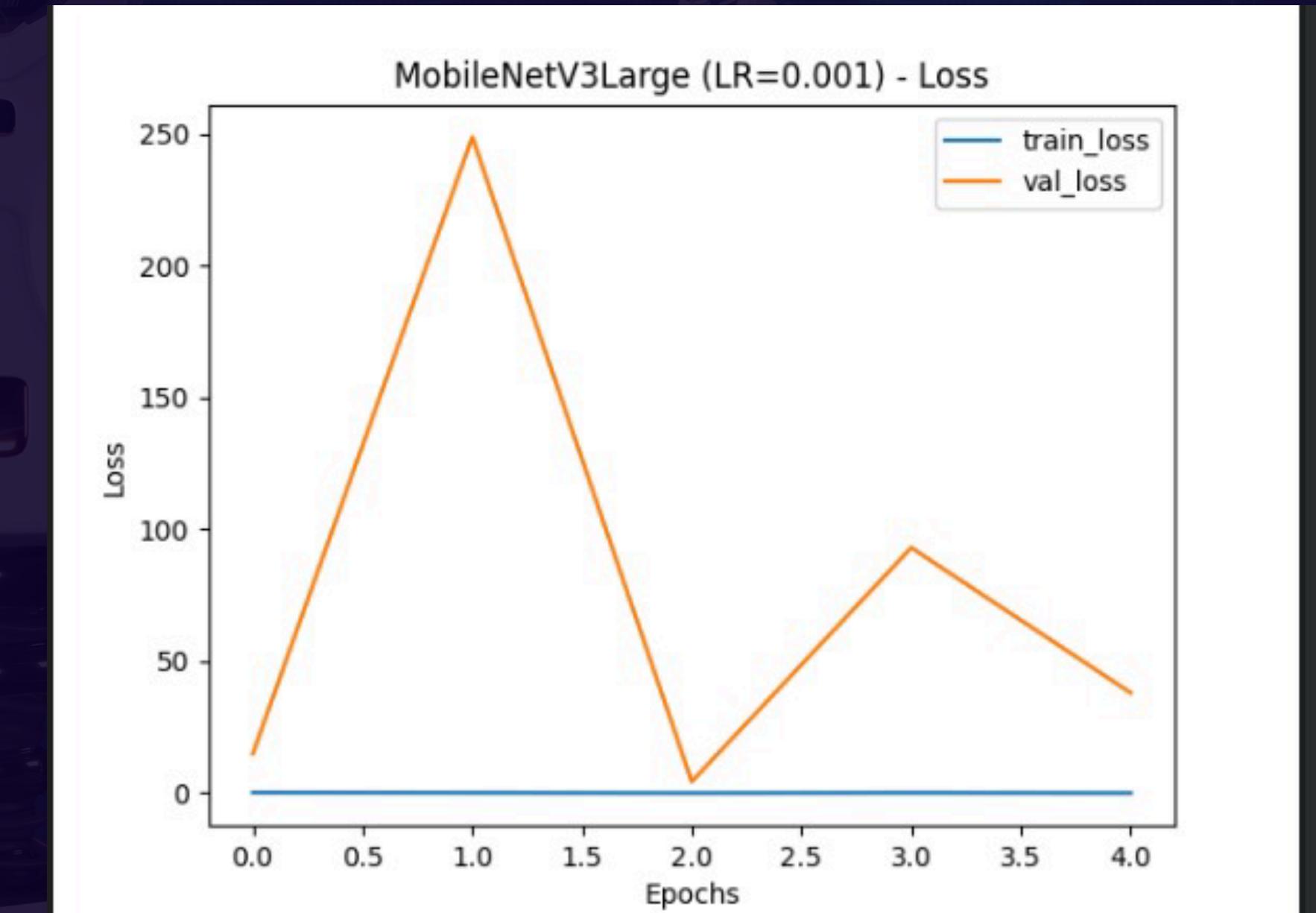


MobileNetV3Large - 5 Epoch

Accuracy

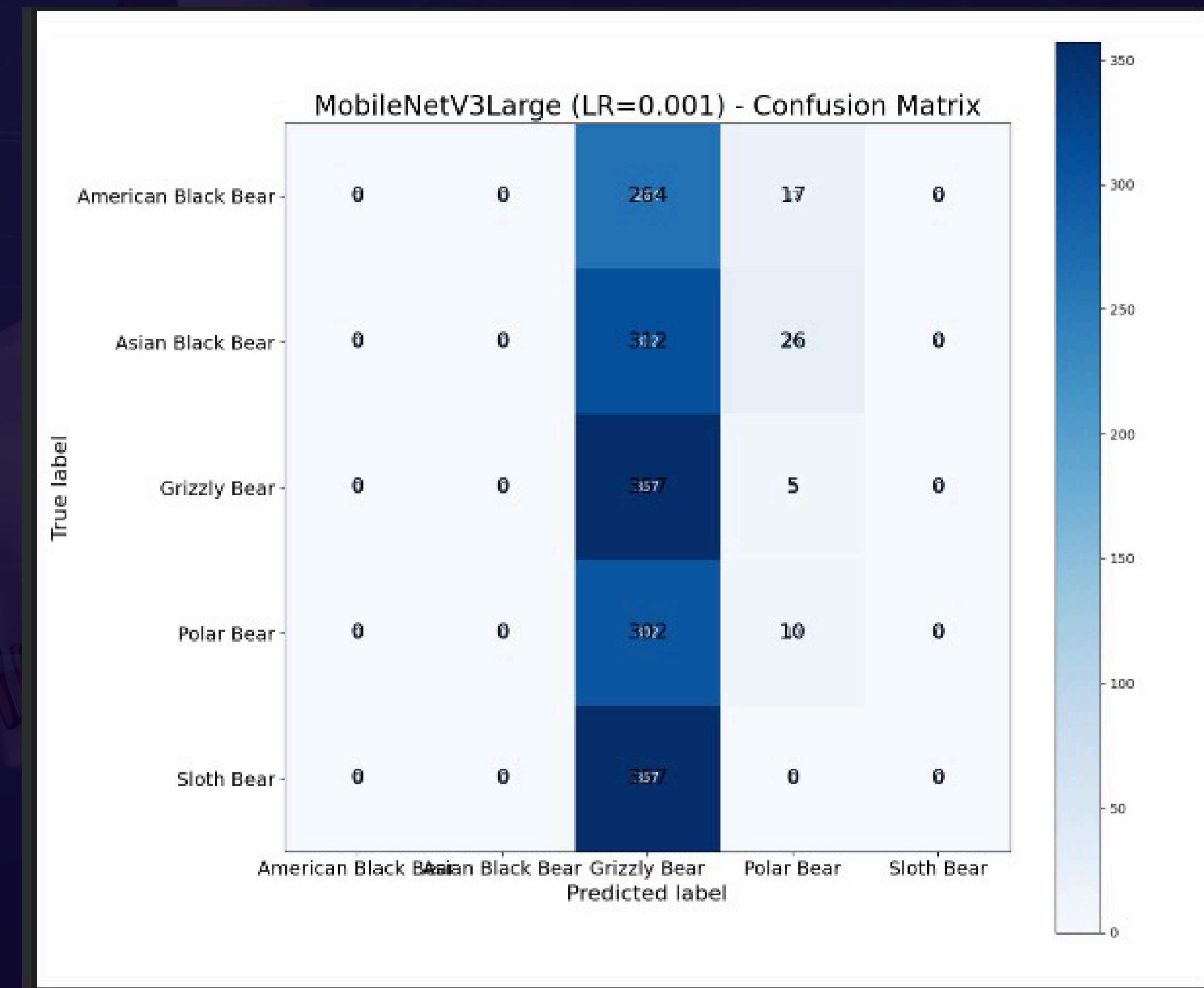


LOSS



MobileNetV3Large

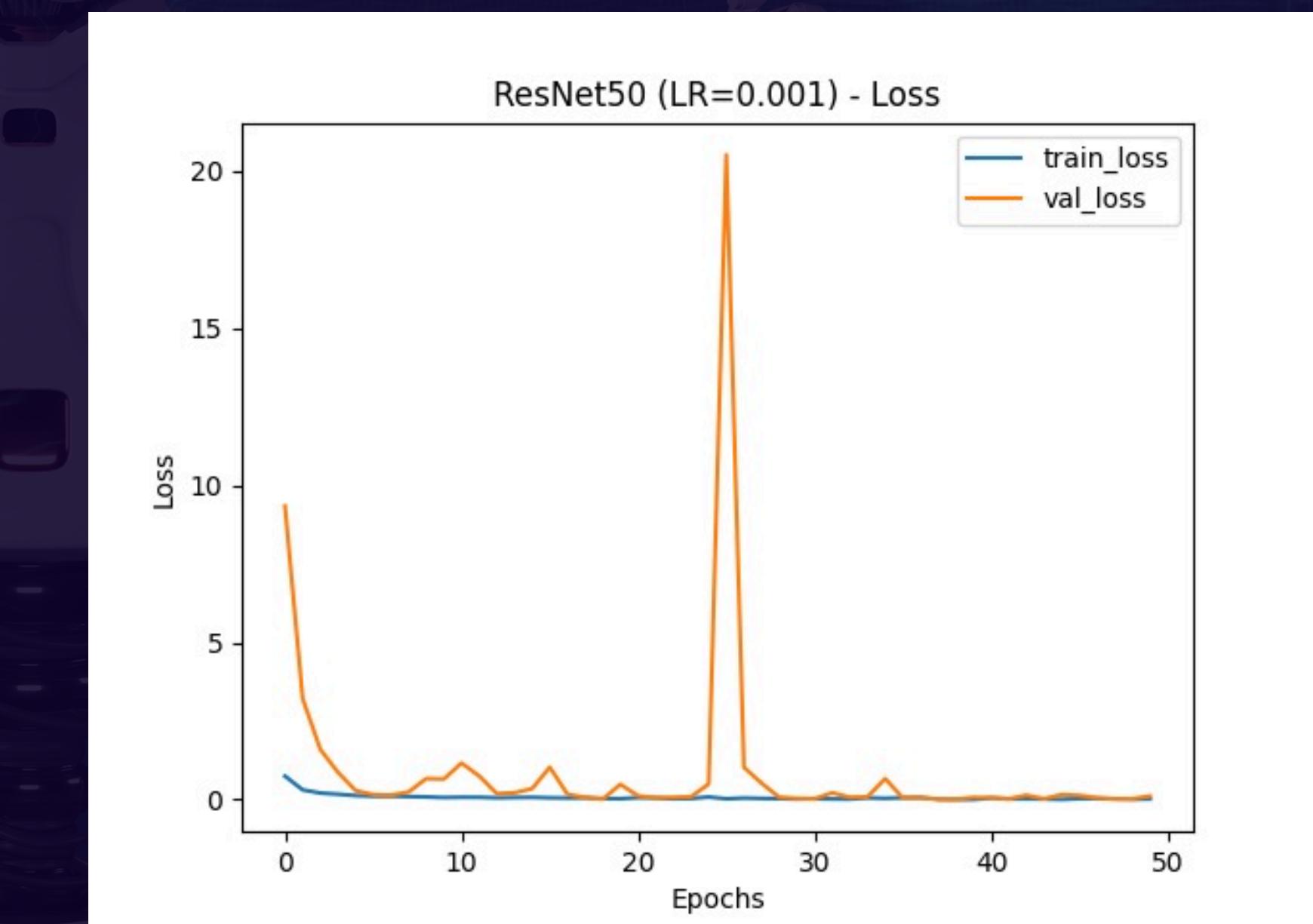
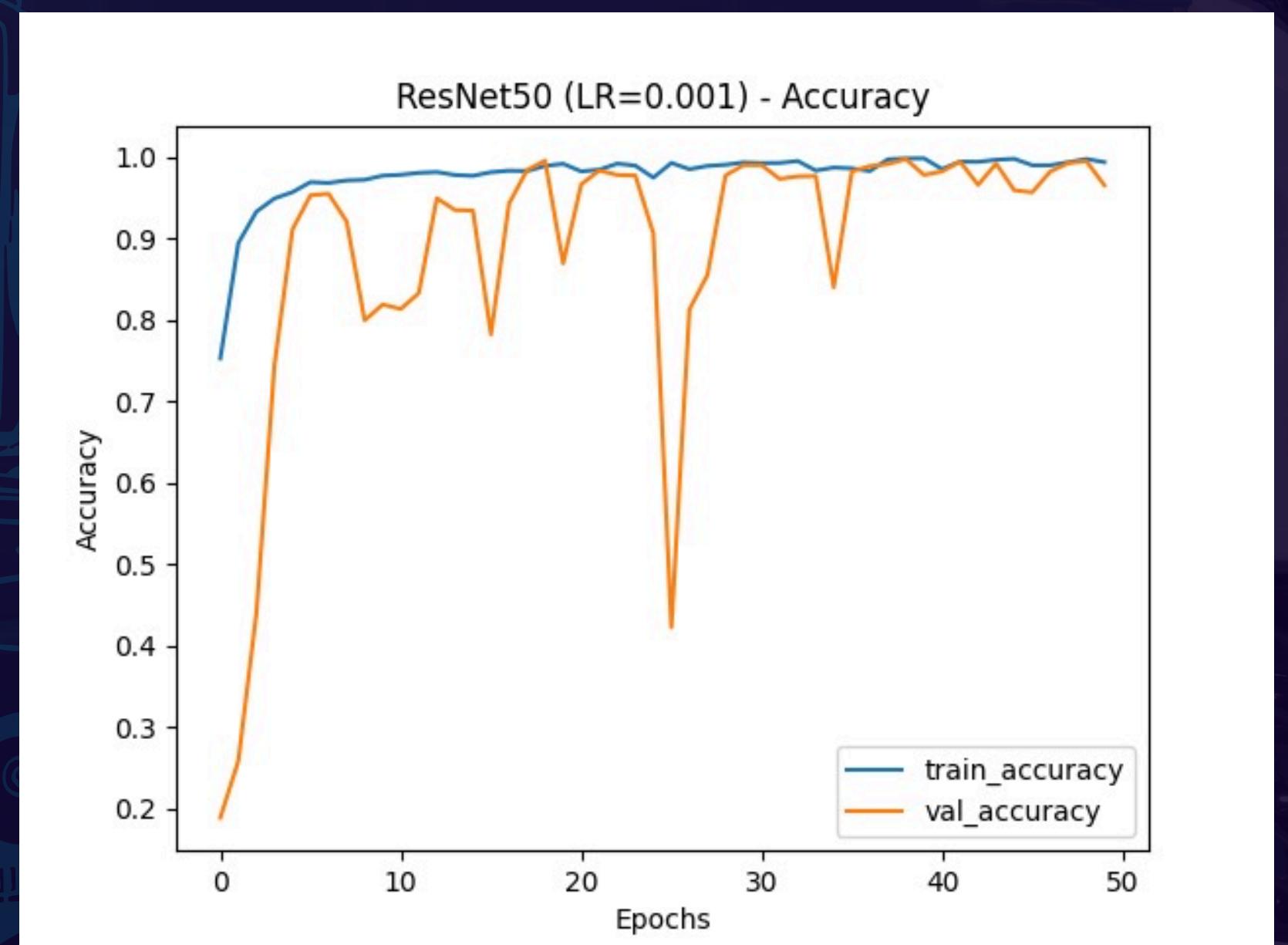
Confusion Matrix



ResNet50

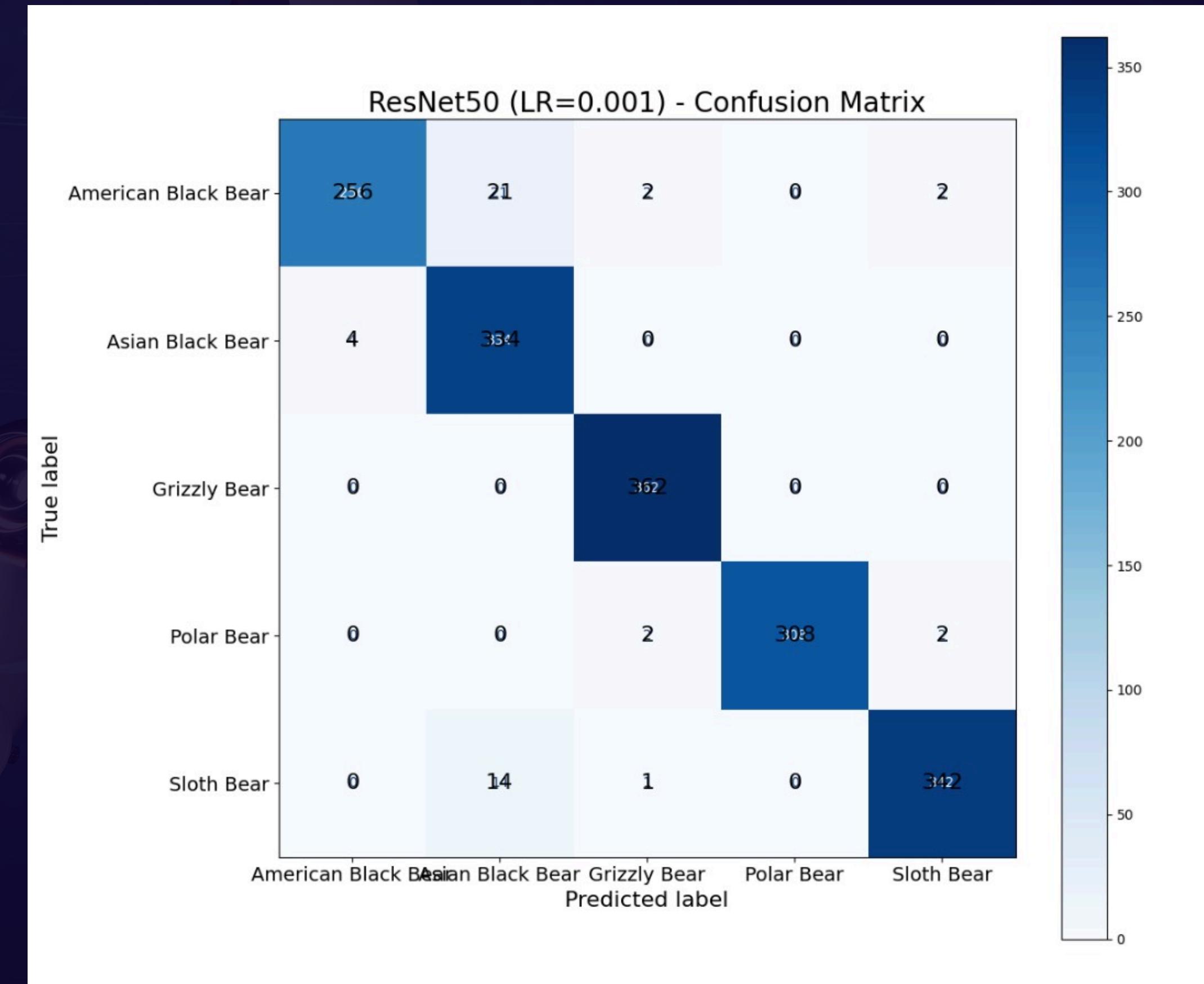
Accuracy

LOSS



ResNet50

Confusion Matrix



DenseNet121

Accuracy: 98.55%

mAP: 0.4927

Training Time: 9634.96 seconds

MobileNetV3Large

Accuracy: 23.21%

mAP: 0.0635

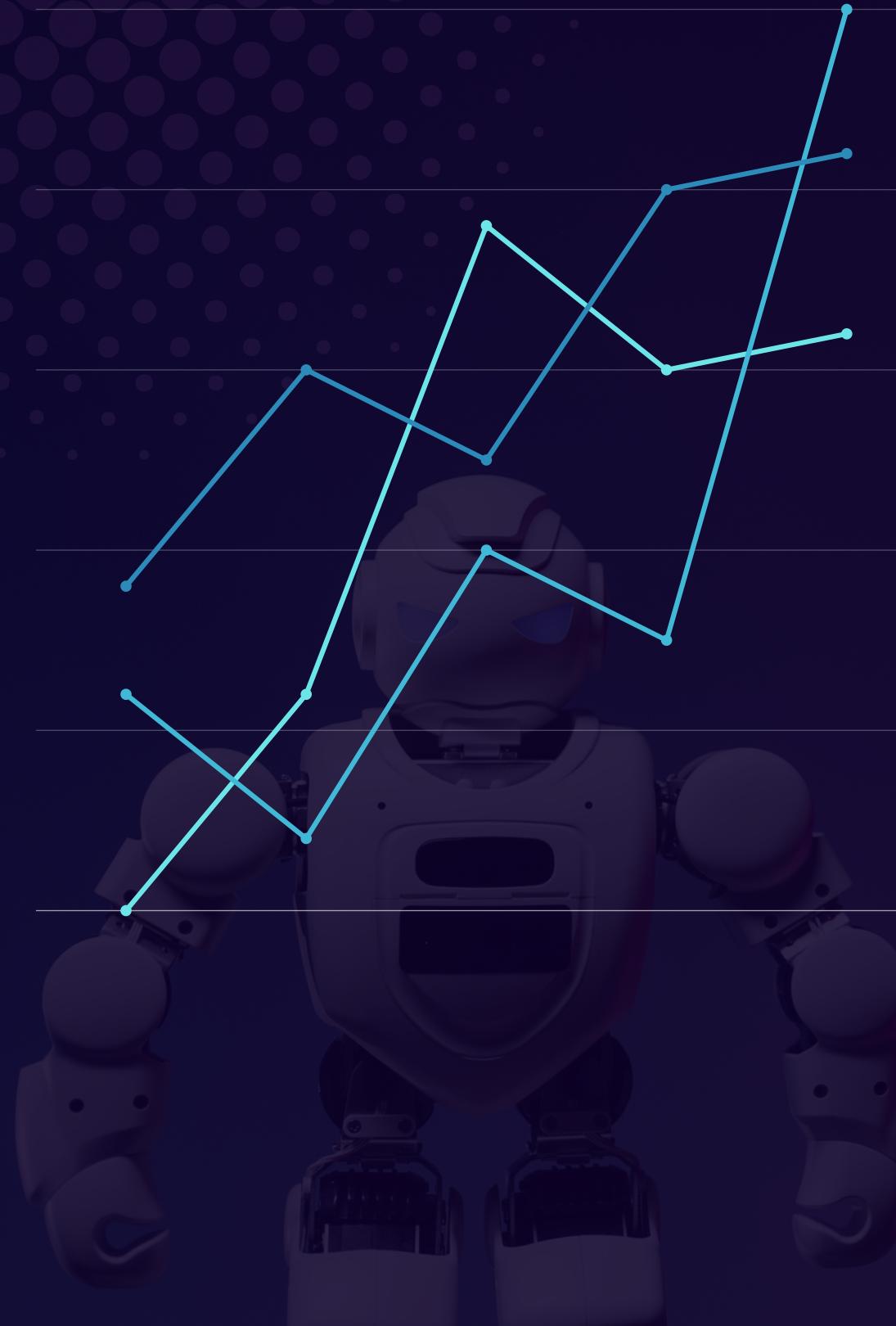
Training Time: 9591.74 seconds

ResNet50

Accuracy: 97.99%

mAP: 0.4585

Training Time: 10172.58 seconds



Explanation

DenseNet121 stands out with the highest accuracy and mAP among the three, suggesting that it can correctly classify and distinguish between different classes more effectively than the other models. Its training time is also marginally less compared to ResNet50, making it slightly more efficient.

MobileNetV3Large significantly underperforms in terms of accuracy and mAP. Despite a slightly shorter training time than the other two, its much lower accuracy and mAP make it the least suitable model for this task. ResNet50 performs closely to DenseNet121, with a slightly lower accuracy and mAP, and has the longest training time.



Conclusion

DenseNet121 appears to be the best model due to its higher accuracy and mAP, combined with a relatively efficient training duration.