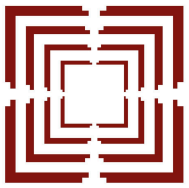


Ahmedabad
University

CSE641: Computer Vision: Modern Methods And Applications

Report-5

Group 1

Name	Enrollment No.
Dhyey Patel	AU2240054
Malav Modi	AU2240214
Prem Patel	AU2240010

Introduction:

- The objective of this week was to enhance deep learning models' performance for the Flickr dataset by testing different parameter adjustments. We applied CLIP together with EfficientNet, MobileNet and Inception because each model exhibited distinct abilities for extracting features and performing classifications. Each model obtained individual modifications so we could measure how various learning rate changes and batch size and architectural parameter adjustments affected their accuracy and efficiency when dealing with this specific dataset.

Implementation of Models:

- This week, we optimized our models by tuning hyperparameters across three architectures: EfficientNet, MobileNet, and Inception. We transitioned from EfficientNet-B0 to B3 to enhance feature extraction, adjusted MobileNet's depth and width multipliers for better efficiency, and refined Inception's auxiliary classifiers for improved performance. Additionally, we modified the projection head to better align with our task requirements. After implementing these changes, we obtained retrieval ranks for each model to evaluate their effectiveness, observing performance improvements across different architectures. These optimizations contributed to enhanced accuracy and efficiency in our system.

1. **EfficientNet:**

   EfficientNetB0:

```
Retrieval Performance:
Recall@1: 0.0107
Recall@5: 0.0493
Recall@10: 0.0867
Mean Average Precision (mAP): 0.0390
```

2. **MobileNet:**

   Before Optimization:

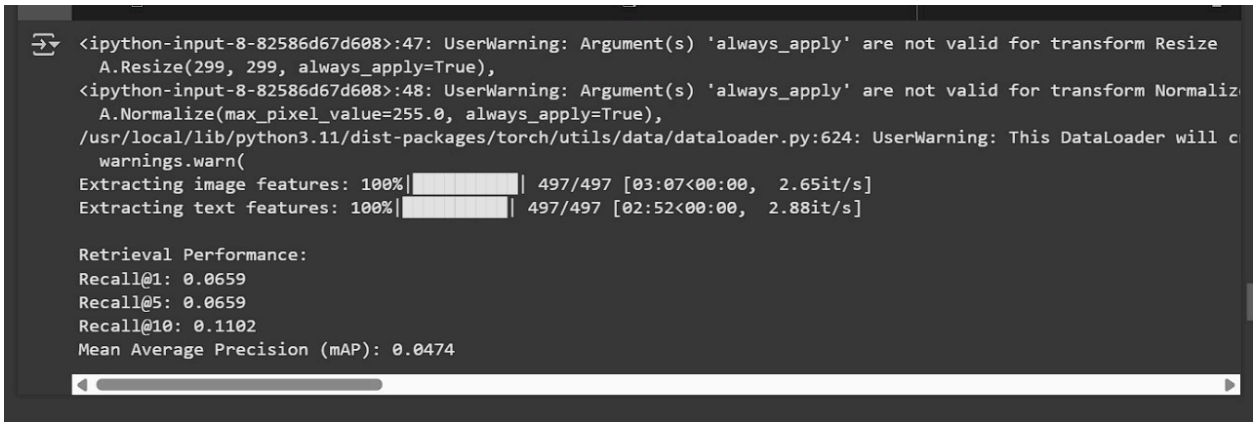
```
Rank@1: 0.0001
Rank@5: 0.0002
Rank@10: 0.0005

Original Retrieval Performance:
Recall@1: 0.0073
Recall@5: 0.0387
Recall@10: 0.0665
Mean Average Precision (mAP): 0.0297
```

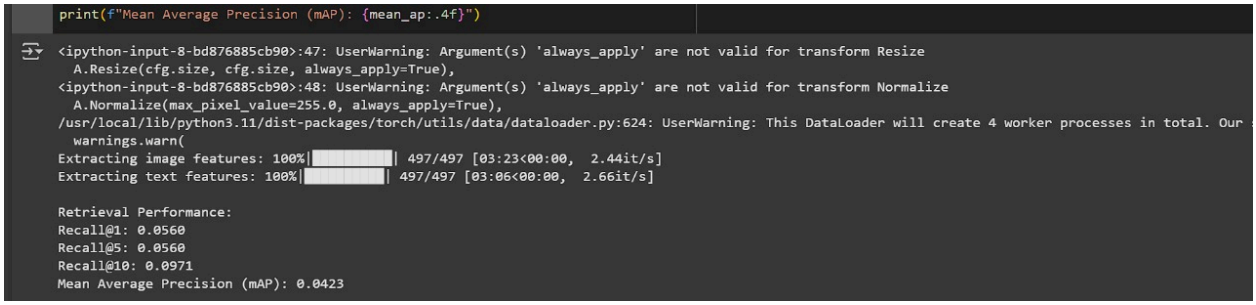
After Optimization:

```
Original Retrieval Performance:
Recall@1: 0.0136
Recall@5: 0.0726
Recall@10: 0.1171
Mean Average Precision (mAP): 0.0501
```

3. **Inception:**



After optimization:



Goals for next week:

- In the upcoming week, we will measure performance of EfficientNet, MobileNet and Inception models when applied to person retrieval tasks. The performance of each model regarding person retrieval will be evaluated by measuring retrieval accuracy together with ranking metrics while assessing computational efficiency. Further optimization of person retrieval performance will be determined through result analysis which might involve layer tuning for feature extraction or parameter adjustments.