Assignment #4

Deep Fashion

Transfer Learning and Multi-task Learning

Due on Nov 30, 11:59 pm

Overview: Transfer Learning

- As discussed in lecture, transfer learning plays an essential role in many vision tasks.
- Torchvision provide many model architectures and pre-trained weights was trained on big general ImageNet dataset.

Overview: MTL(Multi-Task Learning)

- Multitask Learning (MLT) is an approach to inductive transfer that improves generalization by using the domain information contained in the training signals of related tasks as an inductive bias.

- It does this by learning tasks in parallel while using **a shared representation**; what is learned for each task can help other tasks be learned better.

- In this assignment, you will gain experience in transfer learning and MLT. You are to implement a multi-task model to predict the **category and attributes of a fashion item**.

Deep Fashion

- Deep Fashion is a large-scale clothe dataset from The Chinese University of Hong Kong(香港中文大學).
- Dataset have over 800K images (different angles and different scenes).
- Each images of dataset is labeled with:
  1. 50 category (multi-class)
  2. 1000 attributes (multi-label)
  3. Bounding box
  4. Landmarks

Category: 0(dress)

Attributes: floral, maxi

- **10 categories** was selected from source dataset. Have 55845 images.
- **15 attributes** was selected to compose this dataset.

Your task

- Build a deep network (could from pretrained one) that predicts the category and attributes of an item simultaneously (multi-tasking).
- There are two parts of output
  - Category (multi-class classification):
    - Each image could be classified into 1 of 10 categories
  - Attribute (multi-label classification):
    - Each image could be attributed with some of 15 attributes (could >= 1)
- You should consider the choice of activation and loss function

- Note: DO NOT build two models respectively.

Evaluation

- Category
  - Metric: Accuracy
  - Submission format

```
file_path,category_label
deep_fashion/test/00001.jpg,1
deep_fashion/test/00002.jpg,2
etc.
...
```

- Attribute
  - Metric: Mean F1-Score
  - Submission format

```
file_path,attribute_label
deep_fashion/test/00001.jpg,3 10 11
deep_fashion/test/00002.jpg,2 8
deep_fashion/test/00003.jpg,0 10
etc.
...
```

Hints from 2020's me(Important**):**

https://hackmd.io/@teacher144123/HyfKB639w

Things you cannot do

- You cannot submit results predicted by others.
- You cannot copy trained models from others.
- You cannot copy code from others, internet, GitHub …
- You cannot collect more images to train your model in order to boost performance.
- You cannot use the weights of pre-trained model.

Any violation will result in 0 score!

Submission

- Submit your predictions on the test images to Kaggle for evaluation.
- Category

https://www.kaggle.com/t/545986472215456 3af4a3b91eb339f02

- Attribute

https://www.kaggle.com/t/9dc85bed93a2436986bb82f99dc5bb92

- Remember to change your Team Name

- Submit your code to the CU.
- File name: assignment4.ipynb

Grading

- 100% competition
  - Bonus points to top 3 teams
  - Top 3 teams will share their approaches in class