Project 1 - Design and implementation a recommendation system

Web Mining and Social Networking Course

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Date Last Edited: January 2, 2022

Project
1 Design and implementation a recommendation system

Method and Tools

1. Download the WikiArt dataset and apply pre-process on it:
- **WikiArt Dataset page:** https://data.mendeley.com/datasets/289kxpnp57/1
- **Dataset size:** 926 sample in 6 artistic style
- Resize the images to 224x224
- Convert images to matrix

2. Prepare pre-trained MobileNet model for extract features:
- Using imagenet weights
- Delete last layers of the model (output classification layers)
- Predict features of each image
- Create the similarity matrix using cosine similarity formula

3. Recommendation:
- Getting an image from users recommend top 6 images to them.
(suppose that a user like or select an image in search results or feed section our in the social network)

Why MobileNet architecture?
MobileNet is an Efficient Convolutional Neural Networks for Mobile Vision Applications
it's a lightweight deep neural network, and I want to do recommendations in a web app,
so the speed of the predicted time is important for me. Although it is a light model, its predictions have
good results.

Future research:
- Using a bigger dataset
- Train a new/specific feature extractor
- Using another similarities formula

Tools:
- **Programming Languages:** Python
- **Libraries:** Tensorflow, Scikit-Learn, Numpy, Pandas, tqdm, Steamlit

Implementation:
- **Web App link:** https://share.streamlit.io/mehrdad-dev/portrait-painting-recommendation/main/app.py
- **GitHub Repo:** https://github.com/mehrdad-dev/Portrait-Painting-Recommendation

Sample Images:

Some Good Results:

Your selected image

Selected image

Recomendation Results:

Similarity Score: 0.803 | Similarity Score: 0.000 | Similarity Score: 0.794

Similarity Score: 0.787 | Similarity Score: 0.786 | Similarity Score: 0.786

Your selected image

Selected image

Recomendation Results:

Similarity Score: 0.820 | Similarity Score: 0.809 | Similarity Score: 0.790

Similarity Score: 0.787 | Similarity Score: 0.786 | Similarity Score: 0.785

Your selected image

Selected image

Recomendation Results:

Similarity Score: 0.815 | Similarity Score: 0.809 | Similarity Score: 0.799

Similarity Score: 0.798 | Similarity Score: 0.791 | Similarity Score: 0.785

Your selected image

Selected image

Recomendation Results:

Similarity Score: 0.817 | Similarity Score: 0.806 | Similarity Score: 0.703

Similarity Score: 0.703 | Similarity Score: 0.702 | Similarity Score: 0.776