Gossip Arts

Team 17: Liu Yihao, Shi Shangzhou, Wang Zhe, Zhang Yilun

NUS National University of Singapore
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Introduction

- Select various paintings on Wikiart as data.
- According to dissimilar matrix, the clustering is carried out by CD algorithms.
- Based on the painting's style, color, etc.
- MCL, GN, D-Cluster and other community detection algorithms were selected for image classification.
- It is expected to explore the relationship behind works through the connection of paintings.

Objective

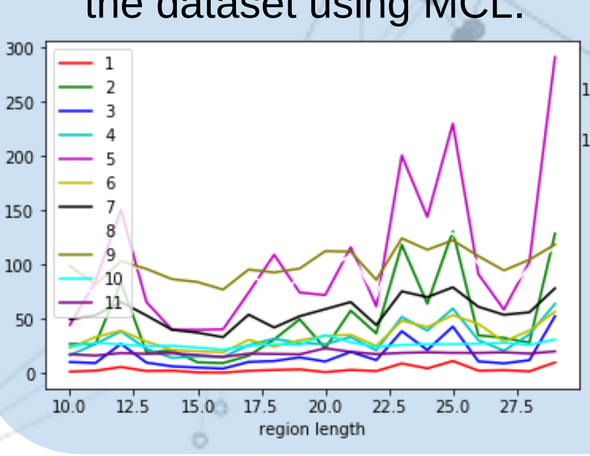
Our research takes different styles of painting as the data. According to the style and the color using of paintings, we can figure out dissimilar matrix. Then we use the MCL, GN and D-Cluster CD algorithms and find out the connection behind different works.

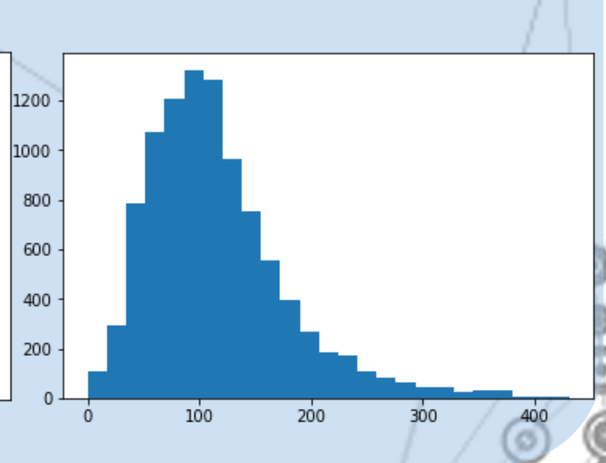
Overview of Our Study

- We choose paintings of different painters and genres from Wikiart as our data set.
- Our tags include the title, painter, genre and time of the painting. Totally 30 painter's works are included and each of them has approximately 14 paintings.
- The resolution of each piece is 100*100. The painters are from Europe, China and Japan.
- We hope that we can uncover the relations between different painting styles, the connections between different paintings of the same author and the possible historical relations among the genres.

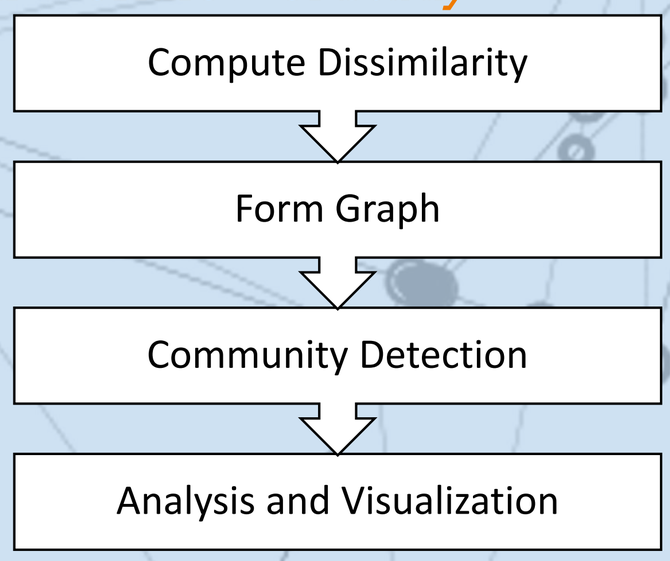
Details of Data & Methods Used

- The dataset is formed by 406 paintings in 30 clusters, each cluster represents a painter. The size of each painting is 100 by 100.
- VGG19 network and transfer learning are used to extract more accurate information of styles. After training, the images are transferred into the network and the style loss is calculated based on result of the hidden layer, which is converted into the grim matrix. What's more, the content of two images is also considered. After it, cluster analysis is performed on the dataset using MCL.





Overall Workflow of Study



Results Obtained

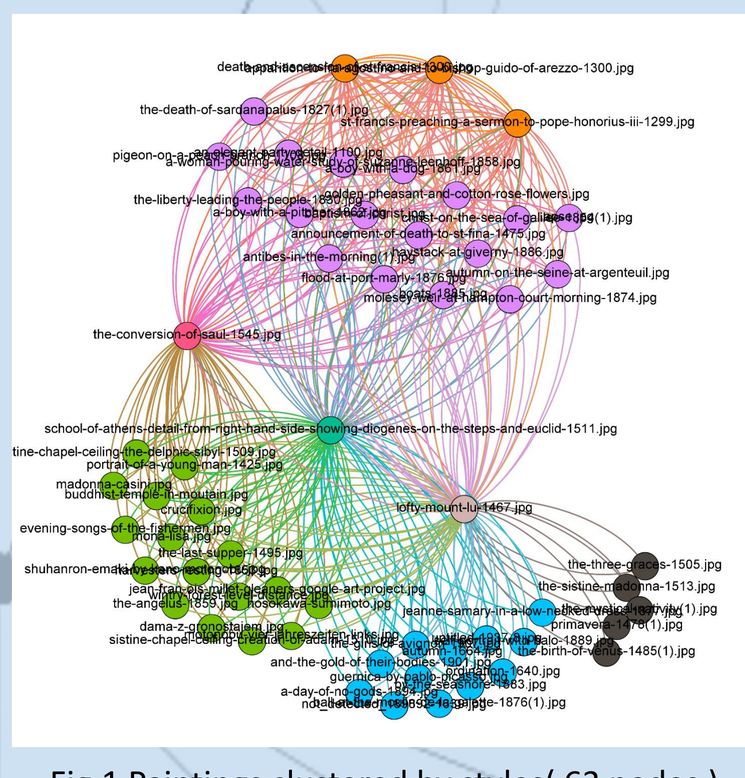


Fig.1 Paintings clustered by styles(63 nodes)

The test set includes 21 artists each with 3 paintings. By using Markov Clustering, the threshold is set to 2000. The communities showed on the Gephi directly illustrate the relationship between Eastern and Western artists and the distinct genre.(See Fig.1)

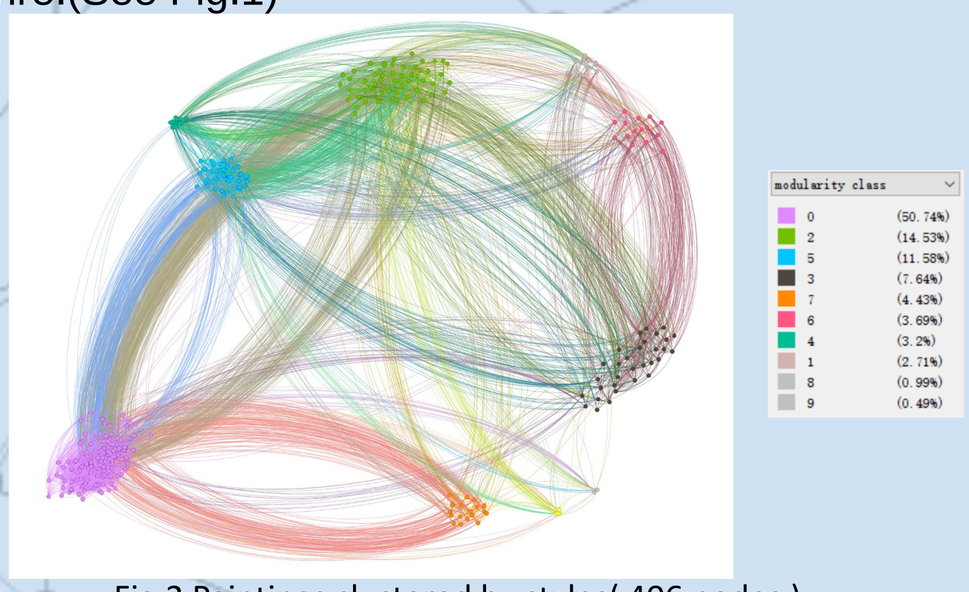


Fig.2 Paintings clustered by styles(406 nodes)

The full set with 30 artists with 406 paintings is applied by 3 different algorithms. The result shows more precise information, which intuitively describes the difference between impressionism and abstract genre and the migration of the style of Japanese arts, etc.

Conclusions, Lessons Learnt

- Arts do speak! Not only the genre is divided, but the details are showed vividly such as the similarity between co-workers and friends, but also the change of arts style as time goes by. Of course, there still be more amazing relationship left behind.
- We learnt the most beneficial thing during the class, the bravery in Skeptical learning, the global view throughout the project and the participation in the team. The project banded the relationship with my teammates to whom I am since rely grateful.