

**01. KANG-Lei\_project2\_report**

1. Summary  
The report applied four methods including MDS, Diffusion Map, Isomap, and LLE to order the faces. They found that MDS failed to effectively solve this problem, while diffusion map, Isomap, and LLE can get a relatively good results.
2. Describe the strengths of the report.  
The report clearly summarized the results with these four algorithms.
3. Describe the weaknesses of the report.  
The report did not analyze the possible reason of why MDS fails to solve this problem.
4. Evaluation on quality of writing (1-5): 4 The report is well organized by covering four types of algorithms.
5. Evaluation on presentation (1-5): 4
6. Evaluation on creativity (1-5): 3
7. Confidence on your assessment: 2

**01. KANG, Lei. Order the faces by Diffusion Map, ISOMAP and LLE**

- **Summary:** This report tries to order 33 face images using Diffusion Map, ISOMAP, LLE and MDS. They find that MDS performs poor in this task and the result is unstable. However, other 3 manifold learning methods give a relatively good order.
- **Strength:** The author makes an intensive comparison between different methods with scatter plots and analysis the robustness of MDS.
- **Weakness:** I think it would be better to define a ground truth and an evaluation metric for comparison. Sentence under subsection 4.4 LLE-embedding has typo and should be change to “The LLE-embedding is implemented ...”
- **Evaluation:**

	Writing	Presentation	Creativity	Confidence
Score	4	4	3	3

01. KANG, Lei. Order the faces by Diffusion Map, ISOMAP and LLE.

*Summary of the report.*

In this paper, Diffusion map, MDS, ISOMAP and LLE are used to find the low-dimensional embedding of the high-dimensional face images. By comparing the scatter plots of the low-dimensional embedding and the face order graphs, he finds that Diffusion map, ISOMAP and LLE can get correct low-dimensional embedding results while MDS performs poorly in this problem.

*Describe the strengths of the report.*

The correct order of photos is visualized to help understand.

*Describe the weaknesses of the report.*

Some quantified measurements can be performed to capture small differences between different methods.

*Evaluation on quality of writing (1-5):*

3

Grammar: Line 1, Page 7. 'we can see ISOMAP is quite stable than MDS and the face order...' should be 'ISOMAP is more stable than MDS and...'

*Evaluation on presentation (1-5):*

3

Presentation with PPT will be better.

*Evaluation on creativity (1-5):*

3

*Confidence on your assessment (1-3):*

3

1. Order the faces by Diffusion Map, ISOMAP and LLE

Summary:

Ordering the faces by diffusion map, MDS, LLE and ISOMAP

Strength of the project:

Comprehensively compared the linear and nonlinear embedding methods.

Weakness of the project:

It is recommended that the author could use some metric to evaluate the performance of each model (compared with the ground-truth). Such that the models could be compared side-by-side with a concise and clear standard.

Evaluation on Clarity and quality of writing (1-5):	4
Evaluation on Technical Quality (1-5):	3
Overall rating:	3.5
Confidence on your assessment:	2

01. KANG, Lei. Order the faces by Diffusion Map, ISOMAP and LLE.

**Summary:** The author uses Diffusion map, ISOMAP, LLE and MDS to find low dimensional embedding of face images. It is found that Diffusion map, ISOMAP and LLE can order the faces correctly, while MDS has bad performance.

**Strengths:** The paper is clearly written. The author uses many different manifold learning methods and compares their performance.

**Weakness:** It is better to have more deeper analysis.

**Evaluation on quality of writing: 3**

**Evaluation on presentation: 3**

**Evaluation on creativity: 3**

**Confidence on your assessment: 2**

1 Order the faces by Diffusion Map, ISOMAP and LLE.

### 1.1 Summary

For Kang Lei 's project, he used Diffusion map, MDS, ISOMAP and LLE to find the low dimensional embedding for high dimensional face images and investigate their property. The result of his work show that MDS is the worst method among these methods. ISOMAP, LLE and Diffusion map have the ability and ISOMAP has faster computation speed compared with LEE

### 1.2 Strength and Weakness

The strength of this paper is that he constructs a thorough comparison between different methods. The weakness is that he did not put the face on the scatter plot which is not easy to recognize.

### 1.3 Score

#### 1.3.1 Clarity and Quality of Writing

The writing of Han is well-organized, the structure of the report is clear. However, the analysis part can be more detailed. I will give him 4/5 on this aspect.

#### 1.3.2 Presentation

He did not make slides for the presentation; I will give him 3/5.

#### 1.3.3 Creativity

Not much creative work is found, I will give him 2/5.

### 1.3.4 Overall

3/5

#### **Group 1**

##### Summary of the report

Order the faces by Diffusion Map, ISOMAP and LLE, using sklearn package.

##### Strength

Compare 3 methods with prediction.

##### Weakness

No ground-truth, the performance cannot be quantified.

Understanding of the methods is limited.

Did not explain why choose these methods.

##### Evaluation on quality of writing (1-5): 3

Not NIPS style; Maybe change 'we' to 'I' since it's one person's work; Title of '2. Datasets', may be better in singular format 'Dataset'; Figure 1 may be better arranged by changing the figsize and subplot setting in the code; Prediction figures is too small to recognize the detail, maybe add index or rearranging subplot settings.

##### Evaluation on quality of presentation (1-5): 3

Present with the report directly, maybe a PowerPoint will be better; language could be more fluent and better organized.

##### Evaluation on quality of creativity (1-5): 2

Only 3 methods is tested and compared, while even sklearn provide 8 manifold learning methods; there is no ground truth to quantified the performance. The conclusion is not convincing.

##### Confidence on your assessment (1-3): 3

## Comment on Paper 1

In paper one, Order the faces by Diffusion Map, ISOMAP and LLE, author used Diffusion map, MDS, ISOMAP and LLE to find the low-dimensional embedding of the high-dimensional face images. After comparing these four methods respectively, author finds that Diffusion map, ISOMAP and LLE can get correct low-dimensional embedding results while MDS performs poorly in this problem.

Author use the four methods to order the faces and the result is the face is correctly ordered by Diffusion map, ISOMAP and LLE. The results of MDS shows that it performs poor in manifold learning, but its extension-ISOMAP can get correct face order. Compared with ISOMAP, LLE can get smoother scatter plots but with more computation time. The two-dimensional scatter plots of Diffusion map and LLE looks to be similar.

Strength: The strength of this paper is that the author uses different four methods to order face data and compare them to come to a conclusion. The result is reasonable.

Weakness: The weakness of this paper is that the 33 faces dataset is small and may not show each method clearly.

Evaluation on quality of writing: 4. The writing is clear and there is no obvious mistake. Pictures and examples are used in this paper.

Evaluation on presentation: 4. The paper is well organized and clear.

Evaluation on creativity: 3.

Confidence on your assessment: 3.

### 1. Order the faces by Diffusion Map, ISOMAP and LLE

- **Summary of this poster:** In this report, the author try to find the low-dimensional embedding of the face images using three Nonlinear Embedding Methods: Diffusion map, Isomap and LLE. It is found that the performance of MDS is poor while the others can get the correct results.
- **Describe the strengths of the poster:** This report uses three different models and compares the performance of these models, which is rigorous and exhaustive. The results they obtained are correct.
- **Describe the weaknesses of the poster:** This report show the results obtained from the three model but doesn't give the detail comparisons among these three models. To make it more clear, I suggest the author add a section, which will include the companions.

- **Evaluation on presentation: 3**

A slide is needed in the presentation.

- **Evaluation on Clarity and quality of writing (1-5): 5**

The report is in well written. The figures are well organized. I didn't find any grammatical mistakes.

- **Evaluation on creativity (1-5): 4**

This report uses three models to analyze the dataset. It also gives the detail methods of these three models. Thus, theoretical analysis is good.

- **Overall rating: 4**

- **Confidence on your assessment: 2**

01. KANG,  
Lei.  
Order the  
faces by  
Diffusion  
Map,  
ISOMAP  
and LLE

The author used Diffusion map, MDS, ISOMAP and LLE to find the low-dimensional embedding of the high-dimensional face images. From the scatter plots of the low-dimensional embedding, author concluded that Diffusion map, ISOMAP and LLE can get correct low-dimensional embedding results while MDS performs poorly in this problem.

Strengths: This is a complete work using four different methods to find low dimensional embedding and get the correct order, comparison among these methods are conducted and analysis on different performance is discussed.

Weakness: The figure in the reports are not clear enough lack of axes titles which may bring confusion for readers during their first reading. The methods and experiments in this report is common.

Evaluation on quality of writing (4): This report is clearly written and well organized, the author should improve the illustrations by adding axes titles on all scatter plots for better demonstration.

Evaluation on presentation (3): Needs to improve, it will be better if the author use slides during presentation

Evaluation on creativity (3): The idea is common by directly applying four methods, no extension or combination both in methods and experiments.

Confidence on your assessment(2)