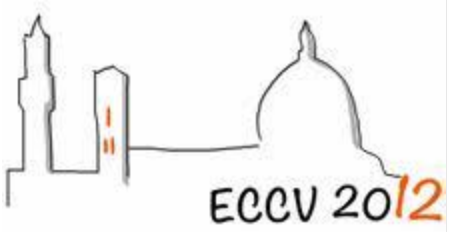
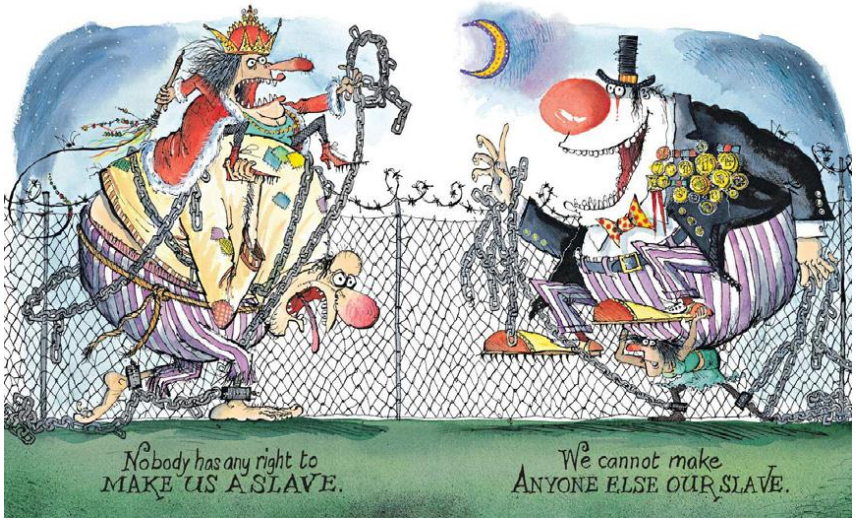


Identification of Illustrators

Fadime Sener, Nermin Samet and Pinar Duygulu

Bilkent University

Motivation



- Human's ability to identify illustrators even in the case of
  - Different characters
  - Irrelevant topics
- Easy to identify the illustrators based on the style of the illustration.

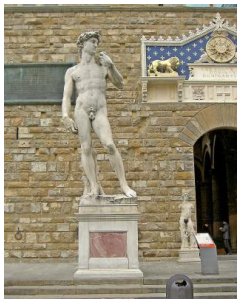
Artist Identification

Google Art Project

- Cross-disciplinary collaboration between art historians and computer scientists

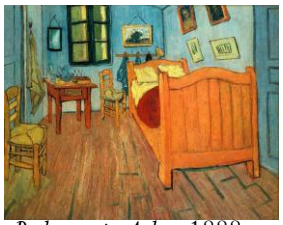
- Identification of an artist or an art style is important to detect replications or followers.


Galleria dell'Accademia, Florence


Replica of *David* in the sculpture's original position, Palazzo della Signoria,Florence

- Identification of painters


The Starry Night, The Museum of Modern Art, New York


Bedroom in Arles, 1888, Van Gogh Museum


Starry Night Over the Rhone, 1888, Musée d'Orsay, Paris.

- **Identification of Illustrators**

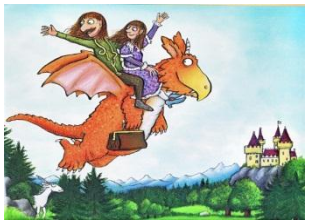

Axel Scheffler

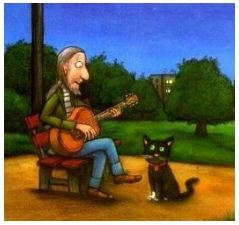

Korky Paul

A New Dataset

- 248 illustrations of Axel Scheffler

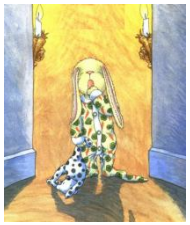




- 243 illustrations of Debi Gliori

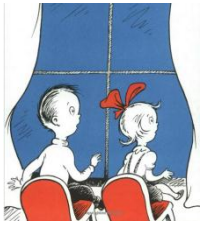


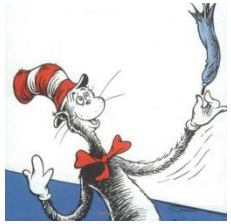




- 249 illustrations of Dr. Seuss



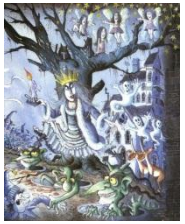



- 234 illustrations of Korky Paul



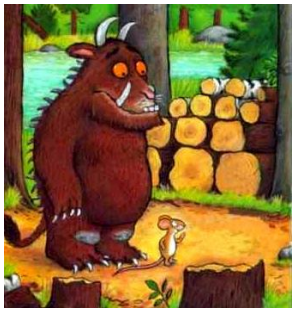



Descriptors - Classification

- Color :

some artists prefer to use multiple colors ----- the others use less number of pure colors



Axel Scheffler

Dr. Seuss

- Advanced features → GIST, HOG, Dense SIFT and Color Dense SIFT features

- SVM with several kernels - one-vs-all manner.

Experiments - Confidence Scores

- Color : Humans' observations about the style of the illustrators.

Axel Scheffler

1.00 0.95 0.93 0.89 0.89 0.88 0.88 0.87 0.85 0.82 0.82 0.81 0.81 0.79 0.79

Debi Gliori

1.00 0.93 0.92 0.90 0.89 0.87 0.85 0.84 0.83 0.83 0.83 0.83 0.82 0.81 0.80

Dr. Seuss

1.00 0.96 0.94 0.93 0.91 0.91 0.90 0.88 0.88 0.88 0.88 0.87 0.87 0.87 0.87

Korky Paul

1.00 1.00 0.93 0.90 0.90 0.89 0.89 0.88 0.87 0.87 0.85 0.84 0.84 0.84 0.84

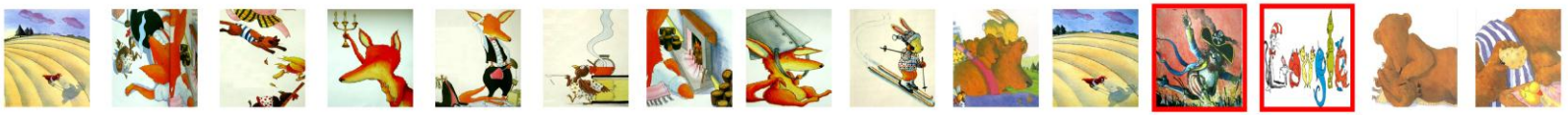
Experiments - Confidence Scores

- GIST Features

Axel Scheffler

1.00 0.95 0.95 0.94 0.94 0.94 0.93 0.90 0.89 0.89 0.88 0.88 0.88 0.88 0.88

Debi Gliori



1.00 0.99 0.97 0.95 0.95 0.92 0.91 0.91 0.91 0.90 0.90 0.89 0.89 0.89 0.89

Dr. Seuss

1.00 0.78 0.78 0.76 0.76 0.75 0.75 0.74 0.74 0.73 0.73 0.72 0.72 0.71 0.71

Korky Paul

1.00 1.00 0.98 0.97 0.94 0.93 0.92 0.92 0.91 0.91 0.91 0.90 0.89 0.88 0.88

Experiments - Confidence Scores

- HoG Features

Axel Scheffler

1.00 0.97 0.89 0.88 0.88 0.87 0.85 0.85 0.84 0.83 0.82 0.81 0.81 0.80 0.80

Debi Gliori

1.00 0.99 0.89 0.88 0.86 0.85 0.84 0.83 0.82 0.81 0.79 0.79 0.78 0.78 0.77

Dr. Seuss

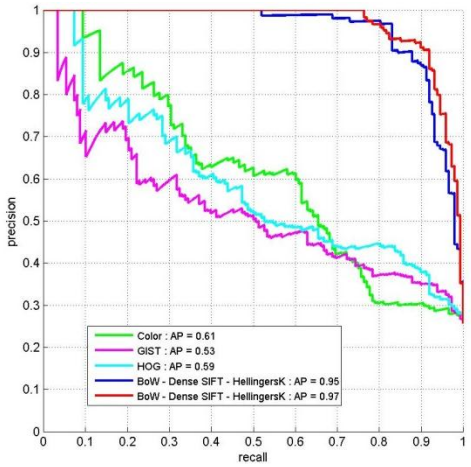
1.00 0.97 0.97 0.96 0.95 0.94 0.94 0.94 0.91 0.90 0.89 0.87 0.85 0.85 0.84

Korky Paul

1.00 1.00 0.99 0.93 0.93 0.92 0.92 0.91 0.89 0.87 0.85 0.84 0.83 0.83 0.83

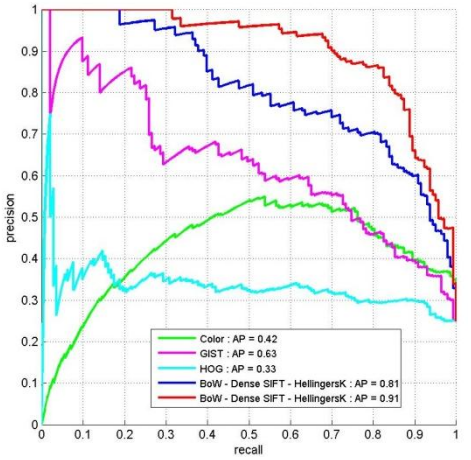
Results

- Precision-Recall curves for each illustrator for all the features.



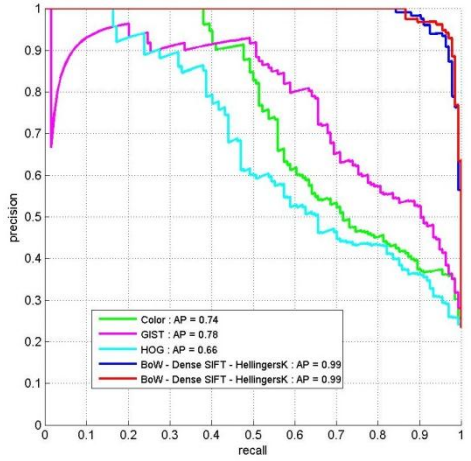
Axel Scheffler

- BoW Color Dense SIFT has better performance



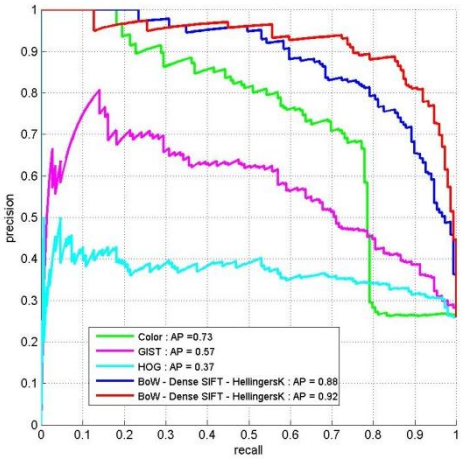
Debi Gliori

- BoW is more capable to discriminate illustrations.



Dr. Seuss

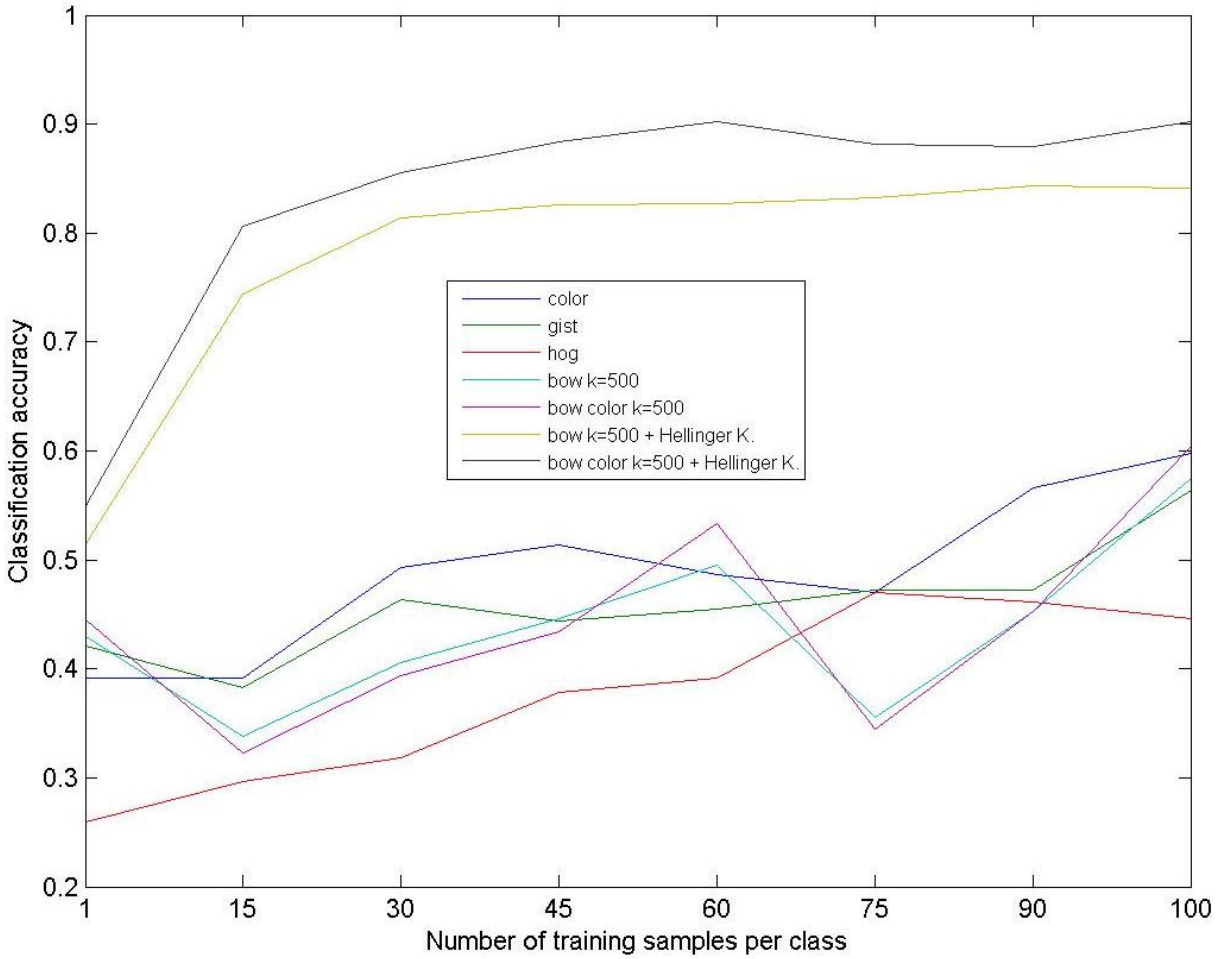
- Color SIFT gets highest performance



Korky Paul

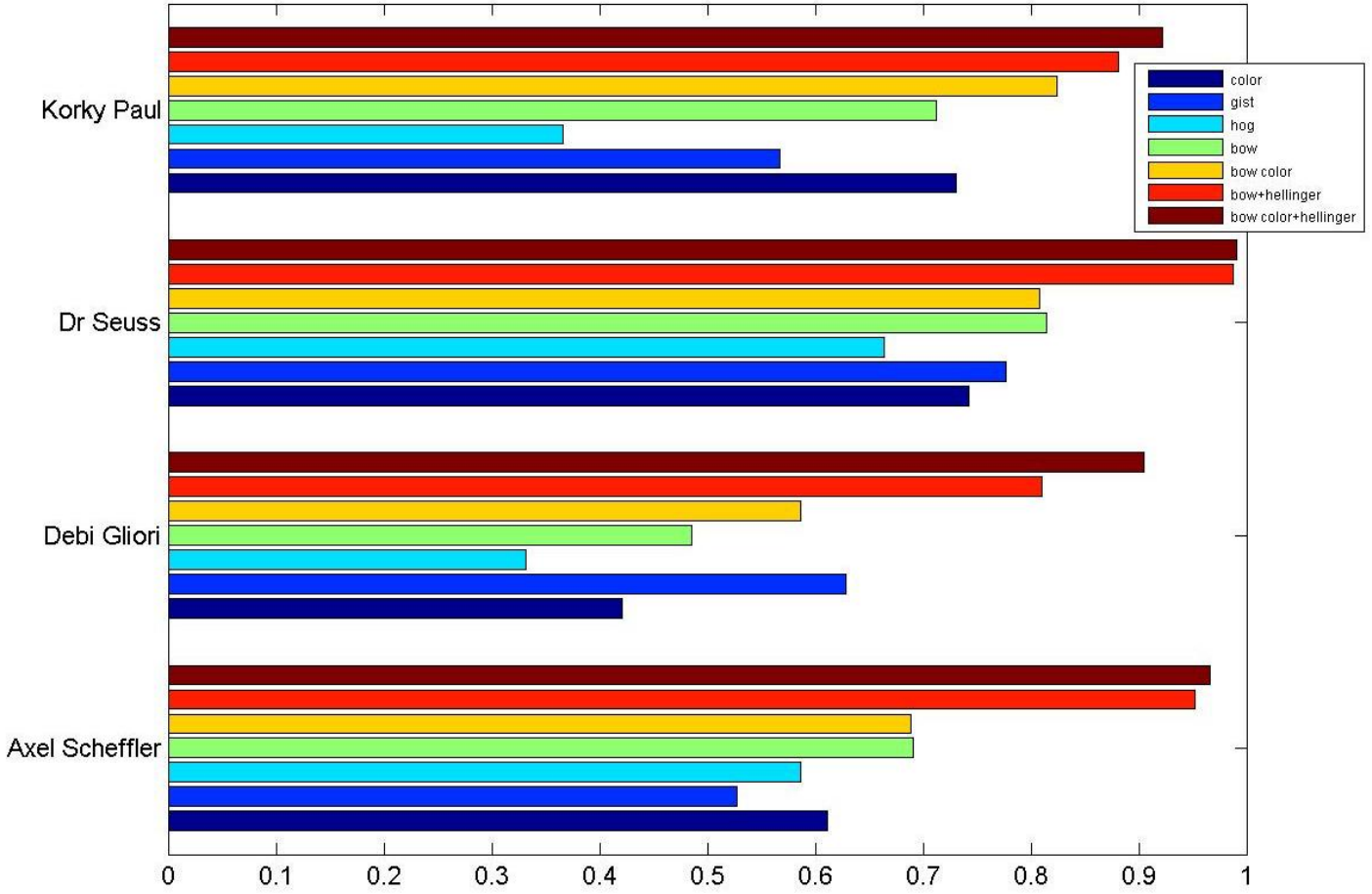
Results

- Overall classification performances.
- BoW Color SIFT feature with Hellinger's kernel outperforms others.



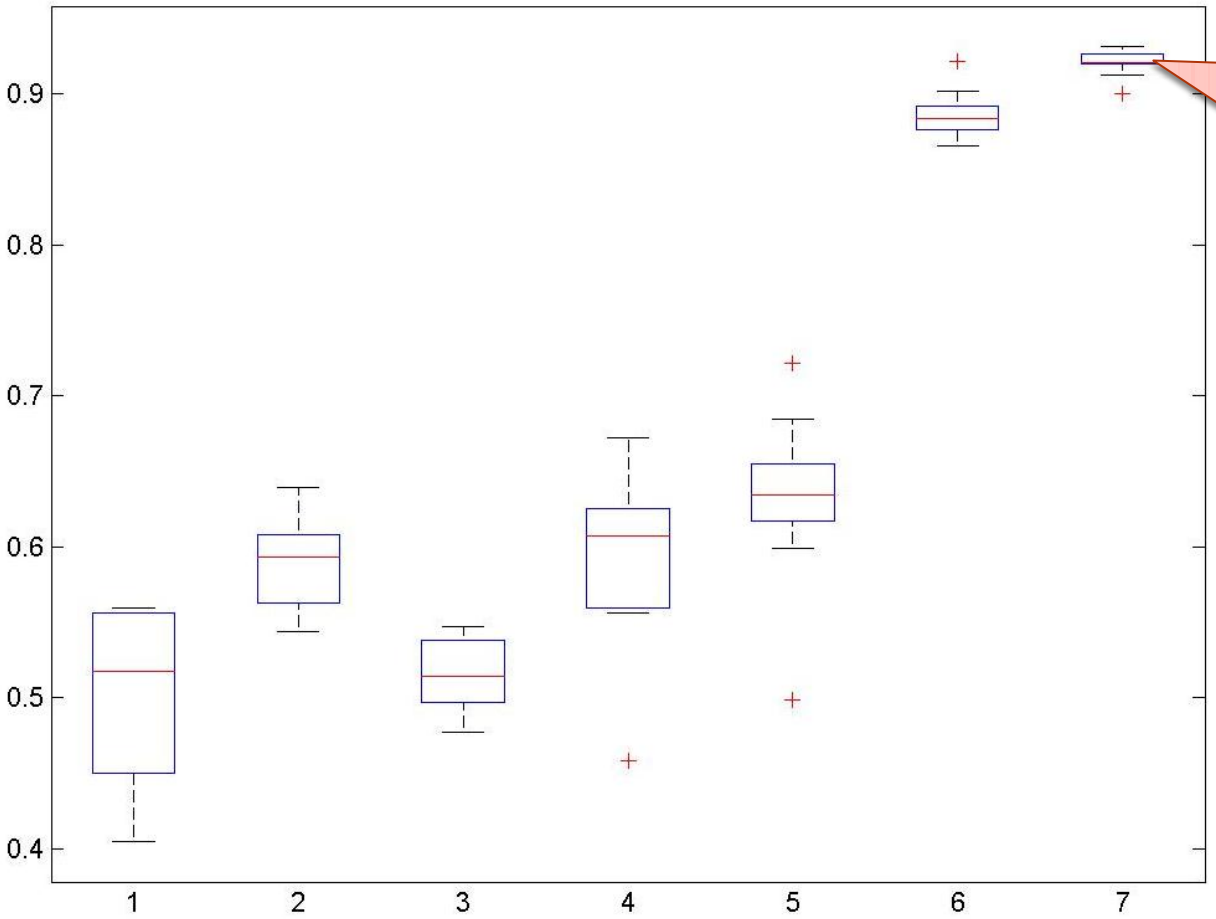
Results

- Classification performances for each illustrator.
- BoW Color with Hellingers kernel has the best performance for each illustrator.



Results

- Results for 10 fold cross validation
- Color Dense SIFT has the least variance.



Color SIFT with Hellinger's kernel

Identification of Followers

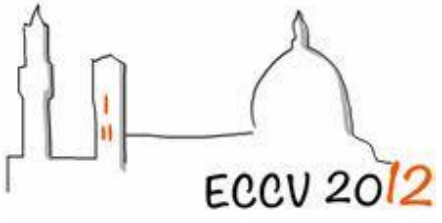
- Dr. Seuss's style is adapted in a series of books by different illustrators.
- Separate original Dr. Seuss's illustrations from the others.

20 58 64 71 87 91 93 104 112 114

Illustrations of the followers which are confused as the original Dr. Seuss works with their ranking indexes

Conclusion

- We address a new challenge
  - Identifying Illustrators.
- Classifiers are successful in identifying illustrators.
- On distinguishing the originals from the followers with high performances
  - Detecting unauthorized copies.
- Plan to extend the set of illustrators and also to focus on more advanced descriptors



Thank You

Dataset will be publicly available via Bilkent University RETINA Vision and Learning Group
http://retina.cs.bilkent.edu.tr/research.html