

A Cluster-Based Visualization Approach for Image Retrieval



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INTRODUCTION

Huge images collections need to be efficiently **organized and managed** in order to turn into useful information. Efficient management of that information requires that data be retrieved and accessed in an **intuitive way**.

PROBLEM

A content-based image retrieval (CBIR) system offers mechanisms to search and retrieve images based on visual properties such as color, texture, shape, etc. Unfortunately, most of CBIR systems have the following weaknesses:

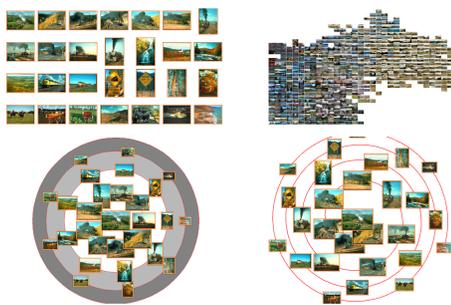
- Too **rigid layout** to arrange the returned images (usually grid).
- **No use of visual characteristics** (as color, size) to provide relevant information.
- Linear ranking in relation only to query pattern. **No intrinsic relationships** between resulting images are showed.

CONTRIBUTION

Our approach provide a **more coherent result** based on information visualization guidelines. It organizes the image universe in a **cluster-based** visual structure that reveals the **intrinsic similarity** between the images. It also allows **query refinement** by choosing any image in the result or by navigating through the hierarchy of clusters.

EXPERIMENTAL PROTOCOL

- Evaluators: **38 users**.
- Evaluated: **5 structures** (4 showed below + 1 proposed).
- Criteria: **5 issues**.

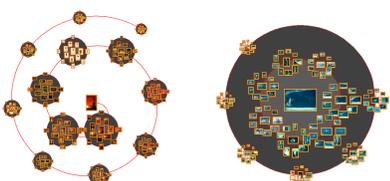


CONCLUSION

Our strategy **outperforms** other literature strategies providing a more coherent and intuitive navigation.

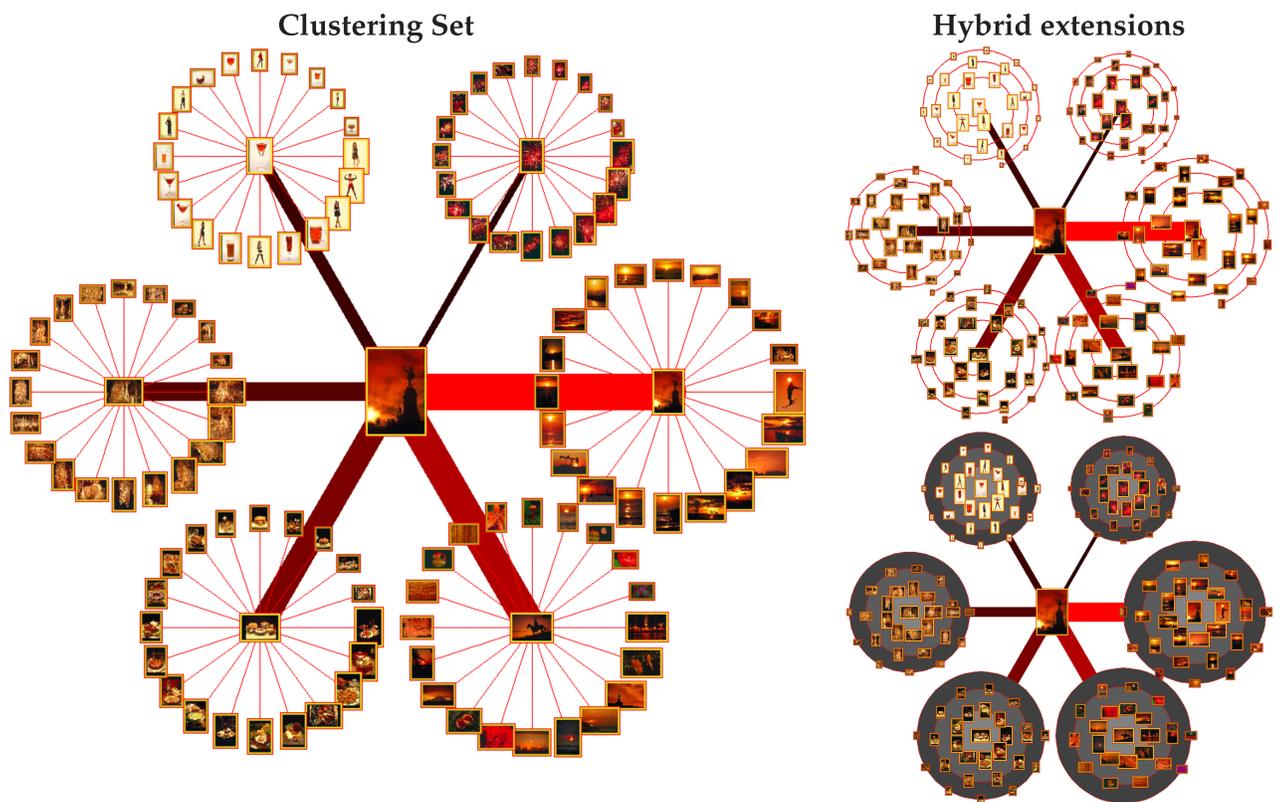
FUTURE WORKS

Extensions to video retrieval [1].
Explore other possibilities from the implemented framework. It allows the automatic creation of hybrid structures as:

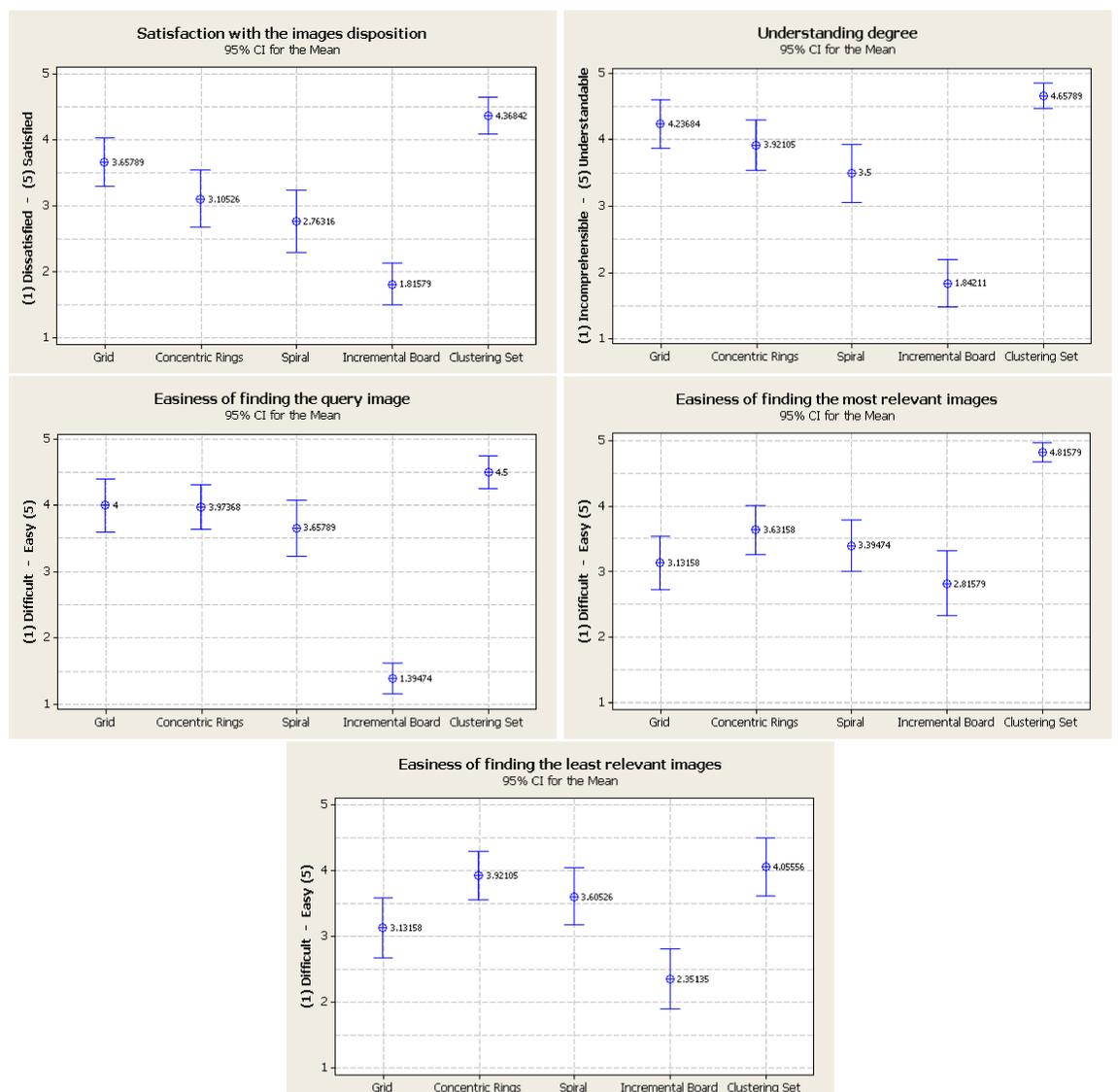


OUR APPROACH

Our approach organizes the image universe in a cluster-based visual structure called **Clustering Set** that reveals the intrinsic similarity between the images from the **most relevant clusters** according to the query pattern. It displays the result set in a well-defined radial layout and allows the **dynamic navigation** through the hierarchy of clusters of images.



RESULTS



REFERENCES

- [1] S. M. Pinto-Caceres, J. Almeida, V. Neris, M. Baranauskas, N. Leite, R. da S. Torres. Navigating Through Video Stories Using Clustering Sets. In *IJMDEM '11*

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