Features Mining for Multimedia Indexing And Retrieval (Poster)

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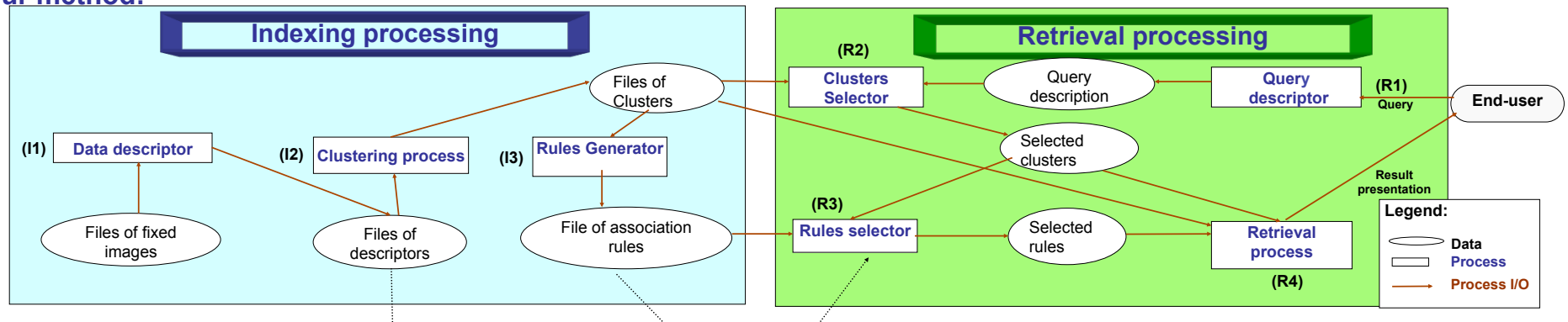
Problem

- How to solve the following problem : Retrieve all the images similar to a given image using appropriate global visual features ?
- What about query response time and quality of results ?

Our aim: Describe a new method applied to large still image databases that combines clustering and association rules mining in order to:

- **better organize the image collections**
- **improve the performance of query processing**

Our method:



Experimentations:

Conditions:

- 7727 of still images
- 5 global MPEG-7 features of color, texture, and form
- **K-means** algorithm for clusters computation and **Apriori** algorithm for association rules computation
- **minsup**= 10% and **minconf** = 50%
- C++ programming under Linux OS

MPEG-7 Descriptors

```
<Descriptor xsi:type="ColorLayoutType">
<YDCCoeff>55</YDCCoeff>
<CbDCCoeff>26</CbDCCoeff>
<CrDCCoeff>37</CrDCCoeff>
<YACCoeff5>15 16 22 15 27</YACCoeff5>
<CbACCoeff2>16 15</CbACCoeff2>
<CrACCoeff2>16 15</CrACCoeff2>
</Descriptor>
```

Association Rules

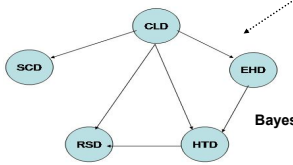
(1, CLD) -> (3,RSD) (11, 69.2)
(2, CLD) -> (2,SCD) (12.3, 67.4)
(2, SCD) -> (2,CLD) (12.3, 55.1)
(2, CLD) -> (0,HTD) (10, 55.1)
(1, SCD) -> (4,CLD) (13, 52.6)
(1, SCD) -> (4,EHD) (12.8, 51.5)

Clusters Support (%) Confidence (%)

Comparison

Rules produced by ACM

Strong relations between modalities of variables	Induced modalities
(2,CLD) and (2,SCD)	(0,HTD) (54.4%)
(1,CLD) or (3,CLD) and (2,HTD)	(0,SCD) (59.7%) and/or (4,EHD) (51.3%)
(0,CLD) and (3,HTD)	(0,SCD) (47.9%) or (3,SCD) (45.7%)
(4,CLD) and (1,SCD)	(4,EHD) (52.6%)
(3,CLD) and (0,SCD)	(2,EHD) (52.2%) and/or (3,RSD) (54.4%)



Bayesian network estimation of features

Conclusion:

- The method can be applied to every kind of very large image databases
- Interesting perspectives for optimizing query plans

Reference: A. Kouomou et al. **Multimedia Indexing and Retrieval with Features Association Rules Mining, IEEE ICME 2004. To appear .**

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