

CSE 515 Multimedia and Web Databases

Phase #1

(Due Sept 16th 2018, midnight)

Description: In this project, you will experiment with

- text and image features,
- vector models, and
- similarity/distance measures

This project phase will be performed by each group member; but, you will get group grades.

- In this project, we will use the data set provided by “B. Ionescu, A. Popescu, M. Lupu, A.L. Ginsca, H. Muller, *Retrieving Diverse Social Images at MediaEval 2014: Challenge, Dataset and Evaluation, MediaEval Benchmarking Initiative for Multimedia Evaluation*, vol. 1263, CEUR-WS.org, ISSN: 1613-0073, October 16-17, Barcelona, Spain, 2014.” Please carefully read the readme file available at

http://skuld.cs.umass.edu/traces/mmsys/2015/paper-5/Div150Cred_readme.txt

- Download the `devset` data from

<http://skuld.cs.umass.edu/traces/mmsys/2015/paper-5>

In this phase, you are free to store the data in a relational database (such as MySQL), a no-SQL database (such as MongoDB), or create your own file/data structures.

- **Task 1:** Implement a program which, given a user ID, a model (TF, DF, TF-IDF), and value “ k ”, returns the most similar k users based on textual descriptors. For each match, also list the overall matching score as well as the 3 terms that have the highest similarity contribution.
- **Task 2:** Implement a program which, given an image ID, a model (TF, DF, TF-IDF), and value “ k ”, returns the most similar k images based on textual descriptors. For each match, also list the overall matching score as well as the 3 terms that have the highest similarity contribution.
- **Task 3:** Implement a program which, given a location ID, a model (TF, DF, TF-IDF), and value “ k ”, returns the most similar k locations based on textual descriptors. For each match, also list the overall matching score as well as the 3 terms that have the highest similarity contribution.

Note: In this phase, the location IDs will always be specified as the “number” field (i.e., 1 to 30) in the `devset_topics.xml` file.

- **Task 4:** Implement a program which, given a location ID, a model (CM, CM3x3, CN, CN3x3, CSD, GLRLM, GLRLM3x3, HOG, LBP, LBP3x3), and value “ k ”, returns the most similar k locations based on the corresponding visual descriptors of the images as specified in the “img” folder. For each match, also list the overall matching score as well as the 3 image pairs that have the highest similarity contribution.
- **Task 5:** Implement a program which, given a location ID and value “ k ”, returns the most similar k locations based on the corresponding visual descriptors of the images as specified in the “img” folder. For each match, also list the overall matching score and the individual contributions of the 10 visual models.

Deliverables:

- Your code (properly commented) and a README file.
- Your outputs for the provided sample inputs.
- A short report describing your work and the results.

Please place your code in a directory titled “Code”, the outputs to a directory called “Outputs”, and your report in a directory called “Report”; zip or tar all off them together and submit it through the digital dropbox.

- MPEG 7 Color Structure Descriptor.

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.369.8132&rep=rep1&type=pdf>

- Local Binary Patterns

<https://liris.cnrs.fr/Documents/Liris-5004.pdf>

- Histograms of Oriented Gradients

<https://lear.inrialpes.fr/people/triggs/pubs/Dalal-cvpr05.pdf>

- Color moments

https://en.wikipedia.org/wiki/Color_moments

- Run lengths

<https://ieeexplore.ieee.org/document/725367/>

<http://what-when-how.com/biomedical-image-analysis/run-lengths-biomedical-image-analysis/>