

Project: Automating Image Annotation via Multi-relational Mining Data Mining Fall 2004

Project Overview:

The task of image annotation can be automated by different mining techniques. The project explores the multi-relational aspect of it and how queries based on different media effects search.

Project Description:

The project will concentrate on application of data mining to real world scenarios, automating image annotation in this case. A database of images and associated annotations will be provided. Association rule and multi-relational mining will be an integral part of the project. The results of image based and text based queries for multi-media data retrieval will also be compared.

Project Details:

Part 0 will basically take care of the logistics. Part 1 will require you to create an extendable GUI. It will be basic interfacing with the rest of the code which will be given to you. You will also be provided with accounts, image and annotation databases for the project. All the groups will share the same read-only image database. The class files and javadocs for CoMMA will also be provided. Each group will also be required to add 25 images to the database. These images can be that of trees, flowers, sky, rivers and other related nature images. The real mining stuff will start in Part 2 where you will be required to implement a limited search engine to retrieve and rank images based on SDD, similarity search and LSI. Rijsbergen's Information Retrieval Book is available at:

http://www.cs.rit.edu/~dmrg/dm_winter/IRBOOK

You can either use the LSI code given to you or use an LSI implementation off the web. More information on LSI and its implementation can be found at J Dowling's website at

<http://www.pcug.org.au/~jdowling/>

Part 3 will require you to extend the retrieval capabilities of your system *i.e.*, given an image return the annotations. You will also be required to evaluate the performance of your system with the help of metrics as given in Project Breakdown.

Project Breakdown:

Part 0:

- Form a team of two students each for the project, send e-mail to MAA. MAA and AMT will compile the e-mail together and get group accounts and oracle accounts from Linus. MAA will update the course webpage to add group information. Each group will maintain their own project webpage.

Part 1:

- Familiarize yourself with CoMMA.
- Add images (each group should add 25 images) and annotations for these images to the database.

- Create a simple GUI that interfaces with the database and displays images and associated annotations. Plan this carefully since you will be required to add other functionality to the GUI later on, such as querying and retrieval.
- The GUI should have an option where the user can click whether the returned annotations are right or wrong. *i.e.*, a feedback 0-bad, 1-good mechanism is required where the option can be logged.

Part 2:

- Extend the GUI from Part 1
- Use SVD and similarity matrix to retrieve images.
- Use LSI to rank images from the database which will be used as the comparison benchmark.

Part 3:

- Given an image your program should be able to retrieve associated annotations and images.
- Compare the performance of image based query vs. text based query wrt time required, scalability statistics, quality of results, etc.
- Calculate the precision and recall of the query results.
- Calculate the f-score, MRFP score of the query results.
- Implement a clustering technique for automating image annotation.
- Submit a final report upon the completion of the project

Deliverables:

- Completion of tasks 0-3
- The code should be well-documented and commented along with instructions on how to run it.
- A well written final report citing examples or scenarios on how to run your application.
- Performance measures/scores should be reported with proper explanations and charts as required.
- TBD

Deadlines:

TBD

References:

- COMMA: Combing Multimedia Multi-relational Associations, A Teredesai, M Ahmad, J Kanodia, R Gaborski, The 7th ACM SIGKDD Workshop on Multimedia Data Mining, Seattle, WA, USA, August 2004
- The CoMMA Website: <http://www.cs.rit.edu/~dmrg/CoMMA/>

Report Format

Use the LAC report template for your final report. Refer to the following URL for instructions: www.lac.rit.edu/instructions.html

Contact:

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(Any changes to this document will be communicated through the newsgroup.)

<http://www.cs.rit.edu/~gradlife/phpBB/phpBB2/index.php>