
MO805A — Topics in Information Retrieval
MC950A — Content-based Image Retrieval

Professor

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Additional Information

http://www.ic.unicamp.br/~rtorres/mo805A_19s1/index.html

1 Syllabus

Introduction to Information Retrieval (retrieval models, evaluation). Image Databases (query languages, query processing, indexing mechanisms). Content-based Image Retrieval (image description, similarity search, relevance feedback). Applications.

2 Objectives

This course has two main objectives:

- Provide theoretical background on multimedia retrieval concepts.
- Introduce students to technologies, through the development of class projects, related to state-of-the-art algorithms in the area of multimedia retrieval.

3 Timetable

Group A

Day	Time	Room
Monday	16–18	CC-52
Wednesday	16–18	CC-52

Office hours:

Office hours will be announced at the course site.

4 Assessment Criteria

Assessment will be based on the following criteria:

1. 35%: Theoretical and practical class projects.
2. 35%: 2 Tests.
3. 30%: Class assignments.

4.1 Important Dates

- Test 1: 24/04/2019
- Test 2: 12/06/2019

4.2 Final Grade

$Grade \geq 8.5$	$7.0 \geq Grade < 8.5$	$6.0 \geq Grade < 7.0$
<i>A</i>	<i>B</i>	<i>C</i>

5 Teaching Strategies

Classes are usually organized in four main sessions. The first session is concerned with providing contextual information. Students are reminded about concepts handled in previous classes, assignments are discussed based on both right and wrong answers provided, and an overview of the current class is presented. The second session comprises a typical 1-hour lecture (based on both slides and board notes). The third session is composed of team-based activities, with the objective of fostering cooperation and an enriched interaction-based learning environment. Usually students are asked to deal with assignments related to the lecture just presented. This session also allows the identification of questions and misunderstandings related to handled concepts. Finally, the last part of the class is dedicated to providing an overview about succeeding sessions and foreseen activities.

Typically, students are also engaged in hands-on activities (e.g., coding, use of available tools, creation of concept maps) when possible, taking advantage of the infrastructure (e.g., computer labs) available at different university facilities. Furthermore, usually, 4-month class projects are assigned to students grouped in teams. The definition of the project usually takes into account possibilities for fostering the development of skills to handle multidisciplinary tasks, as usually addressed problems involve content covered in other domains.

Besides the 4-session class organization defined above, special topics, activities, and assignments are usually proposed with the goal of improving students' research skills, as well as to widen their views regarding the research career in Brazil and abroad. Students are, for example, trained to: identify the most relevant venues (e.g., conferences and journals) for a particular research field; identify the most productive and prominent researchers and research groups at both national and international levels for particular fields; assess the quality of published papers in terms of different criteria, such as originality, technical soundness, scientific rigor, weakness and strengths, and presentation aspects (e.g., writing style, figures, tables); improve their writing skills (e.g., through assignments dedicated to the proposal of specific sections of papers such as abstracts and conclusions); write proposals targeting specific calls handling research problems associated with topics covered in the course; give lectures about pre-defined topics and/or about recently published papers in selective conferences and journals. All assignment outcomes (associated with both good and bad results) are widely discussed with students.

6 Basic References

Part of the content of references listed below will guide most of the classes. Additionally, students will be encouraged to read papers published in selective venues (journals and conferences), such as ICMR, ICCV, CVPR, ECCV, ACIVS, ACM MM, CIKM, SIGIR, SIBGRAPI, SBBB. Further reading material may be made available when necessary.

References

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- [2] V. Castelli and L. D. Bergman, editors. *Image Databases. Search and Retrieval of Digital Imagery*. John Wiley Sons, New York, NY, USA, 2002.
- [3] E. Y. Chang. *Foundations of Large-Scale Multimedia Information Management Retrieval*. Springer, 2011.
- [4] M. Cord and P. Cunningham, editors. *Machine Learning Techniques for Multimedia: Case Studies on Organization and Retrieval*. Springer-Verlag, Berlin Heidelberg, 1st edition, 2008.
- [5] L. da Fontoura Costa and R. M. Cesar Jr. *Shape Classification and Analysis: Theory and Practice*. CRC Press, Inc., Boca Raton, FL, USA, 2nd edition, 2009.
- [6] A. del Bimbo. *Visual Information Retrieval*. Morgan Kaufmann Publishers, San Francisco, CA, USA, 1999.
- [7] R. C. Gonzalez and R. E. Woods. *Digital Image Processing*. Addison-Wesley, Reading, MA, USA, 1992.
- [8] C. Jorgensen. *Image Retrieval: Theory and Research*. Scarecrow Press Inc, Lanham, MD, 2003.
- [9] M. S. Lew, editor. *Principles of Visual Information Retrieval – Advances in Pattern Recognition*. Springer-Verlag, London Berlin Heidelberg, 2001.
- [10] J.-K. K. Wu, D. Hong, M. S. Kankanhalli, and J.-H. Lim. *Perspectives on Content-Based Multimedia Systems*. Kluwer Academic Publishers, Norwell, MA, USA, 2000.
- [11] P. Zezula, G. Amato, V. Dohnal, and M. Batko. *Similarity Search - The Metric Space Approach*, volume 32. Springer, Berlin Heidelberg, 2006.