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Task Analysis for Evaluating Image Retrieval Systems in the ImageCLEF Biomedical Image Retrieval Task

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Image retrieval is a poor stepchild to other forms of information retrieval. Whereas a broad spectrum of Internet users, from laypeople to biomedical professionals, perform text searching routinely, very few search for images on a regular basis. While development of image retrieval approaches and systems began as a research field 20 years ago, progress has been stalled by the lack of robust test collections and realistic query tasks that allow comparison of system performance. This problem is one of the motivations for the ImageCLEF initiative, which aims to build test collections for image retrieval research. ImageCLEF is a part of the Cross-Language Evaluation Forum (CLEF, www.clef-campaign.org), a challenge evaluation for information retrieval from diverse languages. Similar to the Text Retrieval Conference (TREC, trec.nist.gov), CLEF operates on an annual cycle of test collection development and distribution, followed by a conference where results are presented and analyzed. One of the subtasks of ImageCLEF focuses on biomedical images. The ImageCLEF 2004 cycle was the first year of the biomedical image retrieval task. The retrieval task consisted of finding medical images similar to an index image with respect to anatomic region, modality, view direction, and radiological protocol.

Finding images similar to an index one is, of course, only one type of image retrieval task. In ImageCLEF 2005, we are seeking to expand the types of image retrieval tasks. To that end, we have undertaken a qualitative assessment of such tasks from real-world clinician, educator, and researcher users. We will use the data from interviews with 10-15 of these users to develop a taxonomy of image retrieval tasks that will enable us to not only develop queries for our test collection but also undertake a more comprehensive analysis of image retrieval uses. The interviews are currently underway and the results must be completed by March to be used by this year's ImageCLEF. Therefore, even though we do not have results to report at this time, we will definitely have them completed to present at the Slice of Life conference in June.

We are also working to increase the size and scope of the ImageCLEF biomedical image test collection with the goal of developing a resource that will augment further research in image retrieval techniques and systems. Sources to be added include the teaching collection of the Medical Image Resource Center (<http://mirc.rsna.org/>) and images indexed in the Health Education Assets Library (<http://www.healcentral.org>), which includes 36,000 images, videos and animations. We look forward to discussing this project with Slice of Life participants who are likely to have such images to possibly contribute and/or an interest in improving image retrieval.