

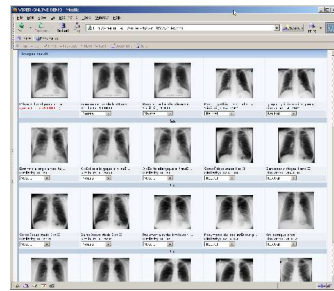
ALLOWING CONTENT-BASED VISUAL DATA ACCESS TO A RADIOLOGIC CASE DATABASE

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Goal: The large amounts of visual data currently created in medical departments create a need to develop new tools to access the data other than by patient identification or by a created case hierarchy. The *casimage* case database allows to search by free text in the annotation of stored cases. Goal of the presented project was to develop an interface based on web technologies that allows to query the images from the cases stored in *casimage* by their visual content, and that allows to access the textual data stored in the *casimage* system as well.

Method: We use the *medGIFT* program (<http://www.sim.hcuge.ch/medgift/>) which is an adaptation of the GNU Image Finding Tool (*GIFT*) for the medical domain as a visual retrieval engine. The Multimedia Retrieval Markup Language (*MRML*, <http://www.mrml.net/>) allows an external access to the query engine to execute queries and retrieve results based on web technologies. PHP was used to create an interface that can be use with any graphical web browser. Case information in the *casimage* system is also available via a web interface.

Results: A web-based user interface was developed written in PHP that runs in any web browser. Images can be submitted directly from the hard disk, by URL, or a set of images from the database can randomly be shown on screen for the user to choose a starting query image. Query results are shown on screen with image thumbnails, and images are sorted based on their visual similarity with the query image(s). Diagnoses are shown under the images to help finding interesting cases, if the diagnosis was marked in the *casimage* system. It is possible to mark images as relevant and non-relevant and then restart the query for query refinement. When clicking on an image that has a *casimage* case description, the *casimage* system is opened in another browser, giving access to the textual description and all the images of this case. A web demonstration with almost 9000 anonymized images from 2000 cases is available at <http://viper.unige.ch/~muellerh/demoRSNA/index.php>.



Conclusion: Content-based image retrieval is a first step for computer-aided diagnostics. Still, it allows to explore large, diverse image databases by their visual content and to selectively extract images of potential medical interest. This can be a valuable tool for managing medical case databases as well for teaching as for research. The searchable visual content is fairly complementary to text that is available in the *casimage* system, which means that text and visual content complete each other for retrieval. This can well be represented with a practical demonstration at the conference.