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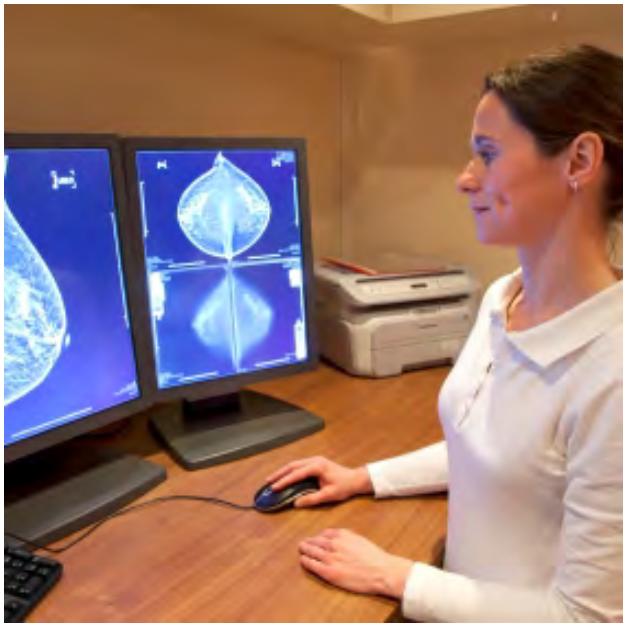
RESEARCH DIRECTIONS

Automated annotation tools

Professor Anthony Maeder from the School of Computing, Engineering and Mathematics will lead the design and implementation of cloud-based software providing a toolkit for use in the management of research collections of digital medical images. Associate Professor Murk Bottema from Flinders University will collaborate in the project, which is funded by Microsoft Research.



'Images of medical conditions are an important resource for clinicians and researchers,' says Professor Maeder. 'There are large collections of images which are essential source datasets for research on population health or disease cohort studies using patient trait information derived from the images. Currently to derive useful information from this data the images must be reviewed in a very time consuming and costly fashion. Annotation of medical images is conducted either manually by highly specialist expert viewers or radiologists or by using complex proprietary computer-assisted-diagnosis software. This is a time consuming and costly process and can result in error and bias in the results. What we need is an easier and more reliable process. Selection of images according to established content-based image retrieval (CBIR) criteria such as "similar to a given image" or "containing a specified range of characteristics" would be more objective if conducted automatically. To achieve this requires a set of software functions which cater for the typical components of image similarity and can be tuned to suit different medical image types.'

The research team will develop, test and tune the software using an existing collection of several hundred images including brain MRI and CT scans, chest X-rays and screening mammograms. The software will be deployed within the Microsoft Azure cloud computing environment, allowing performance evaluation of this new approach to handling large datasets, as compared with a conventional server and network situation. This will allow evaluation of the computational efficiency of the tools, as well as the success of the automated annotations as rated by comparison with human expert opinions.

This project will develop software providing a generalisable toolset to apply specific image analysis tasks on medical digital images, providing information on fundamental visual appearance characteristics of the images for metadata explanation purposes. The research will contribute to advances in a number of clinically related activities, permitting a broader use of image data with a resultant increase in clinical benefits of research.

Project Title: Automated annotation tools for medical image collections
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http://www.uws.edu.au/scem
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