

# eHealth Project of the Month Mammogrid



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## Harnessing grid computing to save women's lives



### Does eHealth contribute to saving lives?

Breast cancer is the most common cancer in women. One out of eight women will develop it at some point in their lives, and it will kill one out of 28 in the EU and the US. But harnessing the power of the grid<sup>1</sup> could help increase the accuracy of diagnoses.

Mammography examinations save thousands of women's lives every year. However the rate of misdiagnosis can in some instances go up to 30%. This is due to physical differences between patients (e.g. tissue density), differences in equipment and procedures and difficulty in using computers and their related applications to detect changes in breast tissue.

Computer-aided detection of this potentially fatal cancer, especially when used together with the traditional method of visually screening mammograms, can shorten the time needed for analysis and also help increase the accuracy of diagnoses.

#### New approach to comparative diagnoses

The team in the European IST project MammoGrid, which ended in August 2005, looked at how the power of the grid could be used to improve diagnosis. The prototype software that resulted is already enabling users – hospitals, doctors, clinicians, radiologists and researchers – to exploit the massive capacity of grid computing to run

advanced algorithms on digital mammograms, stored Europe-wide.

The project team also developed a geographically distributed, grid-based database of standardised images and associated patient data. Already, there are 30,000 images stored from over 3,000 patients, equally balanced between the University Hospital of Cambridge in the UK and Udine in Italy.



The novelty of the MammoGrid approach lies in the application of grid technologies to medical diagnoses, and in providing the data and tools to enable users to compare new mammograms with existing ones in the grid database. Users can access mammograms from a variety of sources, as well as computer-aided detection algorithms to detect micro-calcifications (tiny specks of calcium in the breast that could indicate cancer) and monitor breast density (dense tissue is considered a major risk factor).]

***"The inclusion of new hospitals in the Mammogrid+ network will increase the coverage of the database and make our knowledge more relevant and more accurate. This will allow larger and more refined epidemiological studies. In the end, these techniques could help save lives".***

<sup>1</sup>**Grid computing** is a computing model that takes advantage of many networked computers to model a virtual computer architecture that is able to distribute process execution across a parallel infrastructure. Grids use the resources of many separate computers connected by a network (usually the Internet) to solve large-scale computation problems. Grids provide the ability to perform computations on large data sets, by breaking them down into many smaller ones. (source Wikipedia)

## Prevention and disease detection

"The system in its current version allows users to securely share both resources and patient data treated to ensure anonymity," explains project coordinator David Manset of MaatGKnowledge in Madrid, Spain. "It also supports effective co-working and provides the means for powerful comparative analyses through the use of a standard format for mammogram images". This break-through functionality could lead to major advances in prevention and detection of the disease and opens the door to novel, broad-based statistical analyses of the incidence of breast cancer and its different forms.

## MammoGrid+ further developments

Since the project ended, a new consortium independent of IST funding has been set up to further develop the prototype and take it closer to market needs. Under Mammogrid+, a new set of partners (including organisations such as CIEMAT (Spain's Energy, Environmental and Technological Research Centre), CERN (Switzerland), SES (health service for the Extremadura region of Spain, representing the hospitals of Infanta Christina, Don Benito and Merida), and the university hospitals of Cambridge and Udine) is building on the results already achieved.

The new project team has set up four separate sites, to simulate the needs of four different hospitals and test the latest project developments. The results from these tests have been evaluated by a panel of two IT experts and five clinicians from the hospitals in Spain's Extremadura region.

Their feedback is being incorporated into a pre-commercial release of the software (Mammogrid+ version 1.0) in June 2007. This version is being deployed within the five hospitals collaborating in the project - these hospitals will also receive the hardware infrastructure to host the Mammogrid+ suite.

Future plans include broadening the existing database Europe-wide. Already a further hospital, the university hospital of Cork in Ireland, has shown interest in joining the Mammogrid+ network.

***Mammogrid+ enables distributed and federated storage of medical information as well as distributed data analysis and image processing at low cost.***

\* Picture by IST Results

## Links:

Project website:

European federated mammogram database implemented on a GRID structure (MAMMOGRID)  
<http://mammogrid.vitamib.com>

Project overview:

Mammogrid fact sheet on CORDIS:

[http://cordis.europa.eu/fetch?CALLER=PROJ\\_IST&ACTION=D&DOC=1&CAT=PROJ&QUERY=1166519887114&RCN=63579](http://cordis.europa.eu/fetch?CALLER=PROJ_IST&ACTION=D&DOC=1&CAT=PROJ&QUERY=1166519887114&RCN=63579)

IST Results feature:

<http://istresults.cordis.europa.eu/index.cfm/section/news/tpl/article/BrowsingType/Features/ID/88963>  
<http://istresults.cordis.europa.eu/index.cfm/section/news/tpl/article/BrowsingType/Features/ID/79568>

Health Policy Relevance:

[http://europa.eu.int/information\\_society/activities/policy\\_link/policy\\_cases/index\\_en.htm#Health](http://europa.eu.int/information_society/activities/policy_link/policy_cases/index_en.htm#Health)

## For further information:

ICT for Health

European Commission – Information society and Media DG

Office: BU31 06/73 B-1049 Brussels

Email: [eHealth@ec.europa.eu](mailto:eHealth@ec.europa.eu)

Tel: +32 2 296 41 94

Fax: +32 2 296 01 81

[http://europa.eu/information\\_society/eHealth](http://europa.eu/information_society/eHealth)

Project Contact: David Manset

Maat GKnowledge, Spain

Tel: +34 68 780 2661

Fax: +34 67 347 9175

Email: [dmanset@maat-q.com](mailto:dmanset@maat-q.com)