In the Barco QAWeb Mobile, Barco has released a new version of its QA and calibration App for medical image viewing on the iPad. An optimised visual calibration algorithm, one of the outcomes of the research work done in the CHIRON project, was used to calibrate and perform quality assurance tests on iPad devices. Once properly calibrated, the mobile tablet can display medical images with excellent clarity. A calibrated tablet is ideal for reviewing clinical images during doctor's rounds and represents a convenient alternative when emergency situations arise and a diagnostic display is not available.

The Mobilis framework, a completely functional standalone framework solution connected to the client servers, is a development bio-sensoric tool derived from the results of the CHIRON project. It helps developers, engineering companies and research institutes to create a flexible solution for a variety of uses, such as eHealth, telehealth, telecare, wellness, first responders and other uses. The data can be synchronised via secure connections.

There were also two unexpected spin-offs. W LAB found the work on wireless sensor development in the project to be useful also in the construction sector. In an application for the construction of the new line of the Rome underground, the wireless sensor network is used for remote and continuous monitoring of the strength of the structure, replacing time-consuming regular manual measurements. The mobile platform has also attracted attention from the fitness market.

1.7 High Profile

Frank van der Linden | Philips Medical Systems NL B.V., Netherlands
Project: High Profile (1 April 2011 to 30 June 2014)
Date interview: 5 August 2014

Challenge

Healthcare is one of the main societal challenges of today and the future. One very specific challenge concerns the diagnosis of brain diseases such as tumours, strokes and epileptic fits. This requires medical staff to have a better picture, and thereby insight, of the brain as well as more detailed information about the location of brain phenomena and diseases. Until recently brain images have been susceptible to considerable distortion for a variety of reasons, such as the relatively weak (brain) signals being swamped in an electrically noisy environment and fatty tissue that prevents a clear scan.

Achievement

The goal of the High Profile project was to improve the quality of brain images from acquisition and processing to the visualisation of the results. Not only will this improve the workflow of the hospital but will also produce higher quality images that are more quickly available.

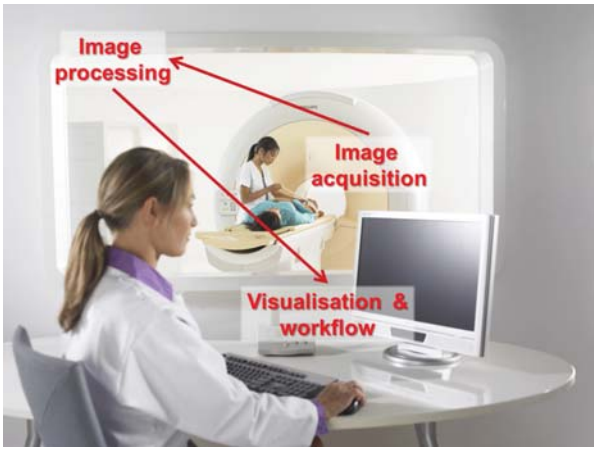
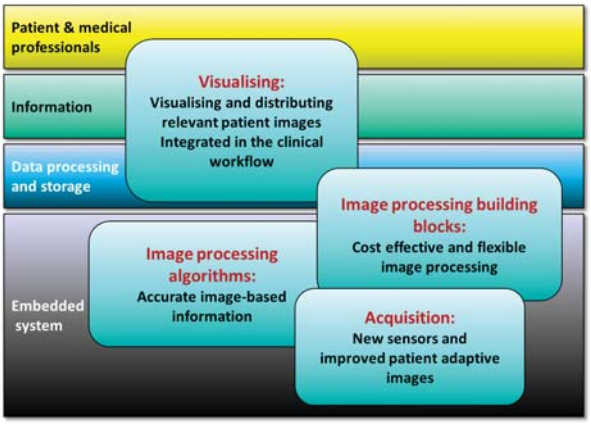


Figure 1: End-to-end neuro-imaging

A set of tangible targets was established covering the whole chain from acquisition to workflow in the hospital. At the image acquisition stage, the removal of noise, distortions and artefacts originating from the context acquisition and the reduction of the size and number of disturbances in images helped to improve the raw images and signals. Also the better mapping between images and signals, and low level of

distortion, enabled the precise location of signal sources in the brain to be shown.

In terms of interpreting signal patterns, this is now much better supported so that fewer interpretation errors are made and the diagnosis can be made more quickly. For instance, improvements in High Profile mean that the patterns of brainwaves of epileptic patients can be recognised and better localised. The use of standard data processing equipment instead of specialised signal-processing hardware produces a consistent result that can be used by the doctor. For instance, this is applied for EEG that delivers 80 separate electric signals. This has been facilitated by information extraction algorithms and acceleration through multicore computing that transform the processed raw images into clearly presented medical information. Of course, with regard to the protection of private data, this guarantee of confidentiality of medical image information is incorporated into the medical workflow.



Field of activity

A total of six image acquisition sources, data fusion, data security and three visualisation environments were part of the project.

Business Impact

Although a clinical evaluation has yet to take place, the project results for MRI (magnetic resonance imaging) and EEG image improvement have already been taken on board by the UMC (University Medical Centre) Utrecht, one of the partners in the project while Philips is already using the project results to upgrade its MRI equipment. Philips has also added the improvements made by High Profile to its equipment software to suppress noise by deleting the noise created by the fatty tissue and/or water in the brain, which enables the zoom capability to look even deeper into specific areas of the brain.

One unanticipated result was the discovery of a new method for creating brain images by infrared technology that, in the future, might become an alternative to EEG technology to measure oxygen saturation in the cortex.

In addition to this, a spill-over from the CHIRON project was incorporated in the project: the presentation of brain images on iPads/tablets in the medical workflow under strict security and privacy conditions. Two Dutch companies are actively developing products based on this technology: AnyWi and Medvision360 (formerly called ZorgGemak). This is considered a newly created market segment. PS-Medtech (NL) has also created a new business line for a novel product whereby the projection of 3D brain images can be used on iPads. Finally, results achieved in High Profile will be incorporated into a new project: ALMARVI.