

Faster, more precise MRI for the medical world

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Magnetic Resonance Imaging ([MRI](#)) revolutionised the medical world two decades ago, providing doctors with an unparalleled view inside the human body. Now, MRI-MARCB has taken MRI to a new level with a system that enhances image quality, reduces scan time and improves diagnosis.

Currently in use in several hospitals around the world, the MRI-MARCB system overcomes one of the principal problems in producing MR images of the brain and heart: movement.

“Though MRI is an excellent non-intrusive imaging modality with excellent soft tissue contrast it is susceptible to motion because it can take several seconds or even minutes to acquire an image,” explains Kay Nehrke at Philips Medical Systems in Germany, coordinator of this IST-programme funded project. “During that time the patient’s heart is beating and they’re breathing – it’s like taking a photo of a moving object. If the photo takes one second the image will appear blurry. If you follow the object with the camera, however, you’ll get a clear image and that is what we’ve done in a sense.”

The project partners used two different but complimentary techniques to overcome the motion problem. In the case of heart scans a software system was developed to create a mathematical model of the pattern of movement caused by breathing and heart beat. That information is then used to compensate for the motion effects in the resulting MR image. For brain scans, where even the slightest movement of a patient’s head

could cause images to be unusable, a camera system was employed alongside the software to track and compensate for motion.

“Without compensation images can be filled with artefacts, making it hard to tell whether you are looking at a clogged artery or just a poor image,” Nehrke says.

With the MRI-MARCB system image quality is greatly improved resulting in more precise diagnosis, while at the same time reducing the time it takes to perform an MRI scan.

“Trials at 10 hospitals with around 200 patients showed a 30 per cent reduction in scan time because of the compensation for movement,” Nehrke notes. “As we all know time is money so this offers important cost savings for hospitals, while patients feel more comfortable because they do not have to worry so much about not moving or even breathing.”

According to the project coordinator, the software can be easily integrated into existing MRI platforms, and the camera system is “relatively inexpensive given the advantages it provides.”

MRI-MARCB is currently being used at hospitals in Germany, Denmark, Japan and the United States, with the project partners planning further commercialisation activities and development in the future.

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