MAGNETIC RESONANCE IMAGE CORRECTION

Magnetic resonance imaging (MRI) is widely used in medical imaging to visualize internal organs. Longer scans provide better quality images but rely on the patient remaining motionless and therefore reduce the throughput of patients. This is an image processing invention that reduces the scan time and allows for motion correction.

- **Decreased MRI scan time**
- **Motion correction**
- **Artificial Intelligence based image processing**
- **Post-processing - no interference with MRI software**
- **Low-cost manufacturing**

THE CHALLENGE

Large amounts of data is acquired during an MRI scan, which is assembled during a post-processing step into a human interpretable image. The more data the better the resulting image.

The throughput of MRI machines is determined by the time it takes to complete a scan and whether scans have to be repeated due to poor image quality, which is often the result of patient movement. A better quality image results from longer scans but this involves increased risk of patient movement and results in reduced throughput and hence a lower number of patients scanned each day.

There clearly is an opportunity to improve both the quality and number of MRI scans that can be run each day.

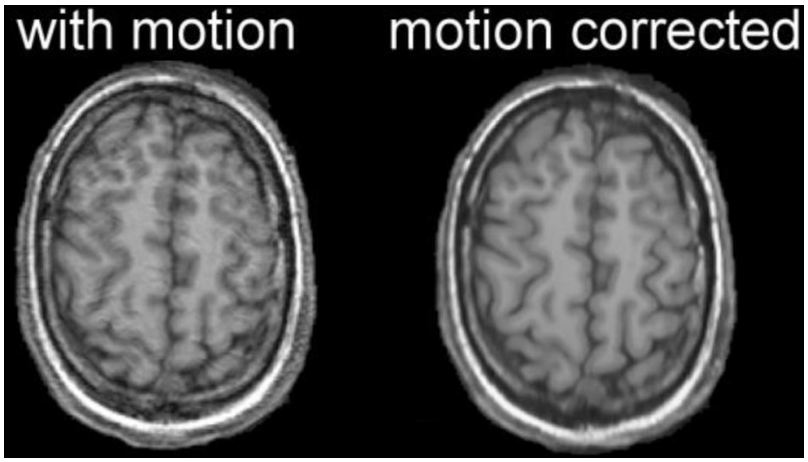

Figure 1. Images showing scan with motion and scan with motion correction.

THE TECHNOLOGY

This invention increases throughput by solving the following two challenges:

- Reduction of scan time
- Reduction of motion artifacts

The technology is a machine learning based image processing method that solves the challenges outlined above. Specifically, Convolutional Neural Networks, also known as Deep Learning, are trained using a large number of MRI scans to solve the challenges.

To reduce the scan time our technology is able to produce high quality images with a data volume that is acquired in a fraction of the standard scan time. This is achieved with a first Neural Network.

A second Neural Network is trained to reconstruct images that are affected by motion artifacts. The results are impressive, as shown in Figure 1.

Intellectual property: Two PCT applications filed (priority date May 2018).

THE OPPORTUNITY

Trials are currently underway in collaboration with a hospital.

We are looking for a partner to take this opportunity to market.

The Team

The team that developed this technology is lead by Prof. Gary Egan, based at the Monash Biomedical Imaging Institute.

References

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2. K Pawar, Z Chen, NJ Shah, GF Egan, (2018) Moption Correction in MRI using Deep Convolutional Neural Network, Proc ISMRM Scientific Meeting and Exhibition 2018.

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