



FEITER A NEW METHOD OF BRAIN SCANNING

BACKGROUND

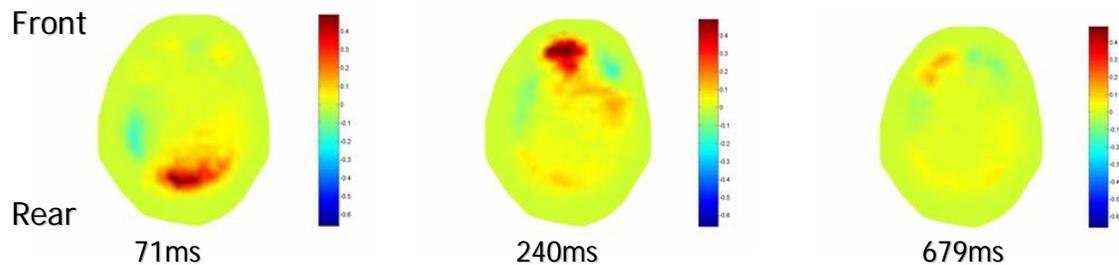
A number of techniques are available for brain scanning and imaging including CT scanners, MRI, fMRI and PET. All require large expensive fixed installations and cannot be made available in all hospitals. Their imaging speed does not allow measuring brain activity or functional responses in the millisecond region..

The University of Manchester is a Centre of Excellence in the field of industrial tomography and image reconstruction and has exploited these skills to develop fEITER (Functional Electrical Impedance Tomography by Evoked Response), an entirely new way of high speed imaging and monitoring of electrical activity deep within the brain. This opens up an exciting and powerful new approach to measuring brain function with potential applications in diagnosing and assessing a range of neurological disorders such as stroke, Alzheimer's disease, MS, Parkinson's etc, and for monitoring brain function in anaesthesia and in neurological and pain research.

THE TECHNOLOGY

A small high frequency electric current is applied to a series of electrodes fitted around the head and the voltages received by an interspersed series of reference electrodes are measured. From the resulting impedance measurements a cross sectional image of the electrical impedance within the brain is constructed which reflects electrical activity in different parts of the brain. The speed of response of fEITER is such that evoked response to external stimuli (sound, light or tactile) can be captured in rapid succession as different areas of the brain respond thus tracking the brain's processing activity.

Reconstructed images of brain conductivity change in response to a visual stimulus, in this case a 50ms flash of red light. The latency from flash to start of EIT data acquisition is shown with each image.





The equipment is portable, can be accommodated on a small trolley or even in a briefcase sized casing and does not require a clinical specialist to operate it. The cost is much lower than CT and MRI scanners (and is comparable to EEG).

KEY BENEFITS

- A new approach to measuring brain functionality
- Measures the brain's *deep* electrical activity
- Fast operation (image capture in under 100 milliseconds)
- Small, portable and non invasive
- Inexpensive

APPLICATIONS

- Monitoring brain function during anaesthesia and in intensive care to ensure the brain is not compromised
- Diagnosis and monitoring neuro-degenerative condition such as stroke, Alzheimer's and Parkinson's diseases, MS and other brain disorders, allowing quick differential diagnosis
- Differentiation of haemorrhagic and occlusive strokes
- Exploring new avenues in neurological, pain and pharmaceutical research

PATENT

Patents pending in key territories

OPPORTUNITY

Of interest to medical imaging, diagnostic and anaesthetic equipment manufacturers and other partners to develop and market commercial instruments collaboratively or under licence.

CONTACT

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