

Bern, 5 May 2006

Press release

Brain research

Deceptively nice images of the brain

Researchers are using high-tech devices and complex calculations to generate colour images of the brain. What are such images used for? What sort of consequences could they entail? The first in-depth report on the subject is about to appear. On 8 May 2006 the Centre for Technology Assessment TA-SWISS and the Swiss Academy of Medical Sciences are publishing the Study “Impact Assessment of Neuroimaging”. In summary, its findings are that neuroimaging offers huge potential for the diagnosis of diseases and better understanding of how the brain functions. But neuroimaging also calls for the people being examined and the data obtained to be handled with care. Neuroimaging impacts on many areas of application. These include biomedical research and neurosurgery, but also cover consumer research, so-called “neuromarketing”.

“It is quite possible that we are overestimating the significance of neuroimaging while at the same time underestimating the limits of the procedure”, is how Bärbel Hüsing from the Fraunhofer Institute for Systems and Innovation Research in Karlsruhe sums up the latest TA-SWISS Study.

Pretty pictures, misleading assumptions

Today, we can produce colour images of the active brain. This is opening up a whole new range of possibilities for examining the brain: medical diagnostics, neurosurgery, biomedical research, or, very recently, even neuromarketing and neuropedagogics. In the last two instances, researchers investigate what happens in the brain when people are shopping or learning.

Unfortunately, this often creates the impression that neuroimaging methods are more precise and therefore superior to psychological tests or other methods. While it is true that neuroimaging measurement methods are precise and reliable, it is difficult to evaluate and interpret the data obtained, and requires considerable specialist knowledge. Even such specialists tend to overlook the complicated experiments that are behind the easy-to-follow and aesthetically attractive images. They lead to excessive expectations and unfounded fears. Today, for example, it could be that the usefulness of neuroimaging for market research is grossly overestimated. But it is also true that fears that neuroimaging could actually make it possible to read thoughts or draw conclusions about someone's personality are unfounded.

Exploit the potential – prevent misuse

The study authors take the view that something has to be done to make even better use of the potential for research and medical diagnostics: scientists need to have access to the equipment in hospitals and clinics even outside peak hours. Greater incentives for the rapid transfer of research results to hospitals would be helpful. High quality and safety standards must be maintained in day-to-day applications to protect patients, test subjects and personnel.

The study authors recommend that the politicians should get things moving on the federal law covering research on human beings. This legislation would also provide a regulatory framework for dealing with neuroimaging in research, and could prevent abuses. Neuroimaging calls in particular for uniform regulations on the informed consent of persons being examined, on procedures to be followed if a disease is unexpectedly discovered, and on data protection; and these regulations must comply with international standards. Society should also be kept broadly informed; that is the only way in which it can actively debate the aims, potential, consequences and limits of neuroimaging.

On behalf of TA-SWISS, Bärbel Hüsing from the Fraunhofer Institute for System and Innovation Research in Karlsruhe, together with Lutz Jäncke, Professor of Neuropsychology, and Brigitte Tag, Professor of Criminal Law, both at the University of Zurich, conducted a comprehensive investigation of the potential and consequences of neuroimaging techniques. The complete report has been published in book form in English. In it, as well as covering the different imaging techniques, the authors deal with the following areas of application: neurosurgery, Alzheimer's disease, drug research, cognitive neurosciences and enhanced brain performance. Other chapters deal with economic, legal and philosophical issues.

TA-SWISS editor of the study:

Impact Assessment of Neuroimaging. Final report of the Centre for Technology Assessment, TA-SWISS 50/2006, Bärbel Hüsing, Lutz Jäncke, Brigitte Tag, Zurich, vdf, IOS Press, 342 p.

Also available (see links):

TA-SWISS Summary (German/French/English):

Einblick ins Gehirn, 10 pages; Regards en coulisse dans les méandres du cerveau, 10 p.; Views of the Brain, 10 p.

Neuroimaging: What is it?

Imaging techniques in brain research (or neuroimaging for short) make it possible to carry out non-invasive examinations of an active brain. At considerable cost in terms of technology, raw data are recorded from experiments on brain structure and function. After complex calculations, these data can be represented as colour images of the brain.

It is the brain that controls human behaviour such as speech, learning and feeling. The findings of brain research can therefore have far-reaching consequences, as such research involves the publication of sensitive information about the people being examined; the situation is similar to that created by gene technology.

Neuroimaging has many different applications: pure biomedical research, clinical diagnostics, neurosurgery and pharmaceutical research. Then there are the cognitive neurosciences and a variety of new disciplines, such as neuropedagogics or neuromarketing.

For further details of the individual neuroimaging techniques, see supplement: "Neuroimaging – the four most important methods".

Supplement

http://www.ta-swiss.ch/www-remain/projects_archive/life_sciences/060505_MI_Beilage_Neuroimaging_4_Methoden_e.pdf

Media information

Monday, 8 May 2006, 19:15 – 20:30, Hotel Kreuz, Bern
Press briefing from 18:30

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Links

Further details about the book (table of contents, etc., in English)

http://www.ta-swiss.ch/www-remain/projects_archive/life_sciences/2006_50_Neuroimaging_p1_p29_e.pdf

Summary (English)

http://www.ta-swiss.ch/www-remain/projects_archive/life_sciences/2006_50A_KF_neuroimaging_e.pdf

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