

Development of Human Brain Image Banks and Age-Specific Normative Brain Atlases

SFC SINAPSE SPIRIT Programme of Knowledge Exchange in Imaging

Supported by: SINAPSE SPIRIT, Guarantors of Brain, the Royal Society of Edinburgh, The British Geriatric Society (Scotland), Nuffield Foundation

Royal Society of Edinburgh, 28-29 August, 2014

A successful international workshop was held in Edinburgh to bring together international experts in brain image banking with researchers and clinicians at all stages of training from a range of disciplines, to share expertise and plan for future developments.

Attendees

84 people attended from nine countries (81 from Europe: Scotland, England, France, Switzerland, Germany, Netherlands, Sweden, 3 from North America: USA and Canada), including eight PhD students (from clinical (geriatric medicine, psychiatry) and non-clinical (brain imaging, tissue brain banking, stroke/depression) backgrounds, and one school student (on a Nuffield Research Placement). Eight invitees asked to bring other colleagues. There were representatives from the majority of widely used brain image banks internationally (MNI [Alan Evans], ADNI [Paul Thompson], OASIS and the HCP [Dan Marcus], GIN [Bernard Mazoyer], INCF/IMAGEN [J-B Poline], BRAINS [Shenkin], EPI2 [van der Lugt], Rhineland [Breteler], Biobank [Smith], UKDP [MacKay], Neonatal Banks [Boardman] as well as INCF [Lanyon]). Presenters and participants came from a wide range of disciplines: clinical specialties (neurology, geriatrics, paediatrics, obstetrics, radiology, psychiatry), epidemiology, database linkage, law, ethics, medical physics, image analysis, statistics, informatics, systems analytics, psychology, tissue banking, preclinical (animal) atlases.

Content

The meeting began with brief descriptions of the main image banks and atlases, and the main challenges that each had faced: presentations can be seen at <http://www.sinapse.ac.uk/event-documents/brain-bank-workshop-2014-presentations>. The rest of the meeting was interactive, with each sessions being split into three randomly assigned groups. Each group discussed one topic, and then fed back to the whole meeting their top priorities for future development and ideas for how to do this. Topics included: What is a minimum dataset? Can we determine normality across the lifespan? Can we combine images from all stages of life in one bank? What is valid consent? What privacy issues do we need to consider? Research tourism, How to harmonise data, Database infrastructure, Adding data, Dealing with brain variability, Data sharing/citation/storage, User interface. The wide range of experience of each group meant that discussions were wide-ranging and best practice could be shared across disciplines. The discussions were summarised in a final feedback session by Prof Joanna Wardlaw.



Prof Paul Thompson, from the University of Southern California, gave the Keynote Lecture 'Brain image banks: essential research infrastructures for the 21st century' which was attended by almost 100 people, and followed by a conference dinner where discussions continued.



Feedback

All attendees thoroughly enjoyed the meeting with comments such as 'excellent workshop' 'very interesting meeting' 'stellar cast' 'great meeting' 'so useful to discuss issues with experts in different disciplines' 'really timely'.

Outputs and impacts

The final discussion session will form the basis for a major paper inspired by the workshop 'Lessons learned and advice for brain image banking'. There is a planned special issue of the journal Neuroimage "Sharing the wealth: Brain Imaging Repositories in 2015" <http://www.journals.elsevier.com/neuroimage/call-for-papers/call-for-papers-for-neuroimage-special-issue-sharing-the-wea/> which will include concise descriptions of neuroimaging data repositories discussed at the workshop. The presentation slides are freely available <http://www.sinapse.ac.uk/event-documents/brain-bank-workshop-2014-presentations>, as is a list of useful resources <http://www.sinapse.ac.uk/research-resources/brains-workshop-resources>. Several links were established to increase involvement in ongoing initiatives (eg INCF, Biobank), and researcher exchanges for PhD students, postdocs and senior researchers are being planned. There is at least one grant proposal now in progress as a direct result of discussion at the workshop.

The workshop was timely as several large new biobanks including brain imaging data are being established (eg the BRAINS bank <http://www.sinapse.ac.uk/research-resources/brains-project>; UK Dementias Platform; the Rhineland study), and funding bodies are keen to ensure that data is properly collected, stored, analysed and shared. There is huge potential for technological advances to support this, but this needs to be done with the appropriate legal and ethical considerations, which will differ between countries. Ongoing multidisciplinary collaboration will be key, and this workshop allowed several people who have been collaborating for years electronically to finally meet in the flesh; inspired many clinicians and researchers to develop potential collaborations, and will result in publications that will be practical and useful to the wider community of researchers in brain image banking.

Susan D Shenkin, 1st Oct 2014