Open Data for Open Science

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The term open science refers to the idea of making the scientific research and data widely and freely available to the society. It is based primarily on the ideas of open access publication and open data.

Similar concepts of open collaboration and citizen science have been successfully implemented in the fields of astronomy [1] and mathematics [2]. In the field of neurosciences, only recently have a few open data projects emerged that aspire to promote and accelerate the onerous research necessary in order to address today's challenges in the exploration of the brain.

The 'Whole Brain Catalog' [3] is one such project developed by a team of researchers from the University of California, San Diego. Consisting of an open source client-server platform and 3D virtual environment, this tool provides rich 3D views for researchers to explore structures deep within the mouse brain in a multiscale spatial framework. Another interesting project, the 'Allen Brain Atlas' [4], was developed by the Allen Institute for Brain Science. The Allen Brain Atlas currently contains genome-wide, high resolution atlases of gene expression throughout the developing and adult brain, human and mouse brain as well as connectivity maps for the mouse brain using techniques such as *in situ* hybridization, projection mapping and transgenic characterization. This allows researchers to explore the areas of differing gene expression in the brain and understand the neuronal pathways. The 'Human Connectome Project' [5], sponsored by the National Institutes of Health (NIH), is a project led by two consortia and its goal is to build a comprehensive map of the neural connections in the human brain. To do so, they will scan 1,200 healthy adults using functional magnetic resonance imaging, magnetoencephalography and electroencephalography, diffusion tractography, and behavioral test data.

Open data seems to be the future direction followed by some of the largest projects in the field of neurosciences. This comes as a consequence of the huge amount of data available, making meaningful analysis of these data challenging and thus rationalizes the choice of freely sharing data and the right of their analysis to the public.

References:

[1] Galaxy Zoo: http://www.galaxyzoo.org/
[2] Polymath: http://michaelnielsen.org/polymath1/index.php
[3] Whole Brain Catalog: http://www.wholebraincatalog.org
[4] Allen Institute Brain Map: http://www.brain-map.org/
[5] Human Connectome Project: http://www.neuroscienceblueprint.nih.gov/connectome

The Importance of Open Source

By Dominik Lang and Matthias Matousek, Members of the Chaos Computer Club

Open source is not about giving away software for free, but about freedom and progress. The freedom to use software for any purpose increases productivity immensely, while severe restrictions strongly curtail any such ambitions. Limiting the use of software also limits its potential, whereas lifting the restrictions allows people to experiment and encourages creativity.

With access to the source, it is possible to study, learn from, reuse and improve upon code without spending valuable time reinventing the wheel. As a side effect, open source often leads to higher quality software through the contribution of more people with a varied skill set.

Open source is about sharing knowledge; a concept our civilization would not have reached its current level of technology without. The freedom to publish a project incorporating parts of other open source projects encourages the formation of a cycle of give and take, which constitutes a crucial contribution to progress.

As an example, the World Wide Web as we know it, consists almost entirely of servers running open source software, enabling people to communicate and share information easily, quickly, and securely over the entire globe.

Open source software plays a significant role in many fields, improves the lives of many people and is a driving force behind technological and scientific advancement.

Further Information:

- Chaos Computer Club: http://www.ccc.de/en/

Interesting Links about Open Access & Knowledge Part 2

Name	Description	Website
OpenStudents	Blog for students about open access to research	http://www.openstudents.org/
Registry of Open Access Repositories (ROAR)	Provides timely information about the growth and status of repositoires	http://roar.eprints.org/
Scholarly Publishing and Academic Resources Coalition (SPARC)	International alliance of academic and research libraries working to correct imbalances in the scholarly publishing system	http://www.arl.org/sparc/