

Big data analysis in neuGRID towards a modern e-Health science

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neuGRID (www.neugrid4you.eu) is a web portal aimed to help neuroscientists do high-throughput imaging research and provide clinical neurologists automated diagnostic imaging markers of neurodegenerative diseases for individual patient diagnosis. neuGRID's user-friendly environment is customised to a range of users from students to senior neuroscientists working in the fields of Alzheimer's disease, psychiatric diseases, and white matter diseases. neuGRID aims to become a widespread resource for brain imaging analyses.

neuGRID was first funded by the European Commission DG INFSO within the 7th Framework Program from 2008 to 2011. Here, the hardware and middleware infrastructure were developed. The second wave was funded in 2011 by the European Commission, now DG CONNECT, under the project neuGRID for you (N4U), with the main aim of expanding user services with more intuitive and graphical interfaces. N4U ended in April 2015.

Through the single virtual access point Science Gateway web portal, users login and access a "virtual" imaging laboratory. Here users can upload, use, and share algorithms for brain imaging analysis, have access to large neuroimaging datasets, and make computationally intensive analyses, all the time with specialized support and training.

Moreover, through the MoBrain initiative (https://wiki.egi.eu/wiki/EGI-Engage:Competence_centre_MoBrain), a neuroscientist will be able to find help and play the modern e-Health science spanning from macro level to micro-level as well and lowering the barriers to defeat a big social plague such as: Alzheimer's disease.

Thanks to distributed services and grid/cloud computational resources, analyses with neuGRID are much faster than traditional-style lab-based analyses. neuGRID's proof-of-concept was carried out when an Alzheimer's disease biomarker (3D cortical thickness with Freesurfer and CIVET) was extracted from 6.500 MR scans in 2 weeks versus 5 years that it would have taken in a traditional setting.

This presentation will introduce this initiative, with a specific focus on the different big data analyses conducted Europe wide so far.

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