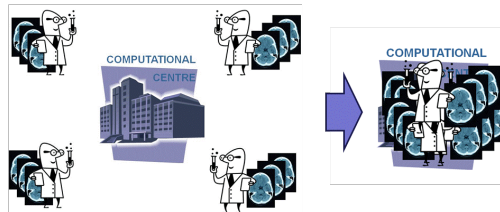


N4U

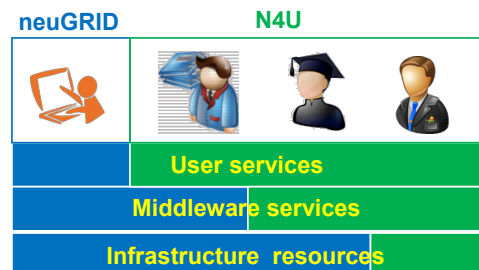


Summary: Unprecedented growth in the accessibility of imaging data of persons with brain diseases has led to the development of computational infrastructures offering scientists access to image databases and e-Science services. FP7 neuGRID is the leading e-Infrastructure where neuroscientists can find core services and resources for brain image analysis. “neuGRID for Users” (N4U) will provide an e-Science environment by further developing and deploying the neuGRID infrastructure to deliver a Virtual Laboratory offering neuroscientists access to a wide range of datasets and algorithm pipelines, access to computational resources, services, and support. The laboratory will be developed for imaging neuroscientists but designed to be adaptable to other user communities. N4U will concentrate on the upper “user-facing” levels.

Objectives: N4U will (i) **integrate** and **augment** the neuGRID **service provision**. Intuitive and customizable workflow authoring and virtualisation, browsing/querying, provenance, and data management, analysis and pipeline quality control, and statistical analysis services will be developed. N4U will build on a robust Distributed Computing Infrastructure (DCI) of **Grid, Cloud** and HPC resources. (ii) Expand the scientific coverage of neuGRID to meet the requirements of new research communities: integrating new algorithms, image processing pipelines, statistical toolkits, and datasets of interest to the NS-NDD, NS-WMD, and NS-PSY communities into the N4U environment. Resources will be integrated that will cover the largest possible area of scientific interest of the three user communities. (iii) Design, develop and deploy user-centred, friendly and customizable interfaces for the daily use of N4U by end users (Science Gateway and portal) by end-users, thereby facilitating access to and usage of resources by a wider and fast growing community. A science gateway and portal will be developed for the target communities. (iv) Develop a Specific Support Center including active learning, training, support and education. The SSC will cover **support and training on all aspects** of the whole knowledge chain from designing a scientific experiment, to uploading or accessing data, uploading and customizing algorithm pipelines, running analyses, visualizing and checking results, and carrying out statistics. By using web services, the SSC will provide users its services **at any time irrespective of their geographic location**.



Action plan: The N4U project will last 42 months and be split into 4 main milestone-led phases: **PHASE 1 - PROJECT INITIALIZATION (M1-12)** This phase will encompass the establishment of an appropriate management structures, the development of a project Website and collaborative tools and of project dissemination, exploitation and concertation plans. Project protocols definition and the setup of a Specific Support Centre Structure, Services and Training plan are also achieved. The specification of project assumptions, constraints, scope and a set of use-cases will be led by a detailed analysis of user community requirements. The Services Area will strengthen the foundational Distributed Computing Infrastructure (DCI), with a first expansion to new Grid resources, supplemented with additional datasets and pipelines of interest. Joint Research Activities will produce an Online Help Desk and Knowledge-base making technical and support material available to the Front Desk for assisting end-users, together with a first N4U Science Gateway release. The main result of the initialization phase will be the N4U SSC support centre, a requirements analysis specification and technology evaluation / design. Phase 1 will be concluded with the launch of the first analysis challenge. **PHASE 2 - PROJECT PROTOTYPING (M13-24)** This phase will comprise: the completion of the first Analysis Challenge; the Specific Support Centre activity and extended



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N4U

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577.10

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HUG	CH
CNRS	FR
UCLA	USA
MNI	CAN

Keywords:
Computational neuroimaging, Virtual Laboratory, Alzheimer's, neuGRID, e-Science, e-Infrastructure

Collaboration with other projects:
ESFRI, EuroBioimaging, JPND, EGI, GEANT, CATI, PHARMACOG, LONI, CBRAIN, DECIDE, outGRID

portfolio; a second DCI API version; an updated toolbox of datasets and pipelines supporting the specification of an analysis challenge and its launch over the DCI infrastructure expanded to new HPC resources; an updated N4U Science Gateway with new interfaces for users; a Data Atlas specification; interim N4U Information Services as well as an N4U Analysis Services specification will be achieved. The main results will be a set of prototype N4U modules made available through the Science Gateway interfaces for the purpose of testing against requirements. Phase 2 will be concluded with the launch of the second analysis challenge. **PHASE 3 – INTERIM SYSTEM DELIVERY (M25-36)** This phase will produce a proof-of-concept system demonstrator. A business and post-project sustainability plan for the SSC will be produced. The completion of the Analysis Challenge is achieved; a analysis challenge specification is produced and will consolidate the underlying DCI with a last expansion to Cloud computing resources. Joint Research activities will lead to the delivery of an interim N4U Analysis Services. The main result from this phase will be the N4U interim system proof-of-concept demonstrator. Phase 3 will be concluded with the launch of the third analysis challenge. **PHASE 4 – FINAL SYSTEM DELIVERY (M37-42)** In the final phase of N4U, user validation tests will be produced in the form of user acceptance results on the information management and analysis environment. The SSC’s legal framework will be formalized. A final DCI API version, exposing the recently updated datasets and pipelines toolbox portfolio, the final N4U Science Gateway and the final N4U Information and Analysis Services will be achieved. Phase 4 will conclude with the SSC validation and its legal spin-off.

Networking activities: In order to have the best working environment for the realization of the N4U objectives, to ensure commitment from its end-users and to establish a ‘lingua franca’ for its design team, a user requirements work package on how the deployed N4U system will affect and will be affected by its user community has been plan among the Networking activities. NA, beyond the regular administration and management activities, will give birth to the fundamental N4U Specific Support Centre, unique and central place for user assistance and embryonic sustainability incubator.

Service activities: In the Services Area, a 3-stage expansion of underlying computing capacity will be carried out, supporting the infrastructure data and applications portfolio extension activities. SA will provide users with an extended set of infrastructural resources spanning from computing capacity to scientific contents, therefore augmenting the scope and possibilities offered to end-users in setting up new experiments within the JRA Virtual Laboratory.

Joint Research activities: In the Joint Research Area the needs of the user community are translated into actions in three separate work packages. With the close integration of work packages and collaboration between partners, JRA will deliver the enabling N4U Virtual Laboratory and Information Services.

User communities: While neuGRID pioneered the lower infrastructural layers addressing the Alzheimer’s Disease and other neurodegenerative disease neuroscientific community requirements, N4U will harness the infrastructure and further develop it to satisfy the need of a larger number of users ranging from students (from high school to PhD), to senior neuroimaging scientists, and neuroimaging scientists specialized in Multiple Sclerosis and other white matter diseases and Psychiatric Diseases.

International aspects: N4U will take formal contacts cooperation agreements with relevant initiatives in Europe and worldwide in the field of biomedical imaging (Alzheimer’s disease and multiple sclerosis), grid computing, and broadband connectivity. Among others, N4U will liaise with the EuroBioImaging initiative, one of the infrastructures of ESFRI; EGI, in particular the Life Sciences Virtual Research Community; PHARMACOG, the largest clinical study on Alzheimer’s currently funded by the European Commission; and DECIDE, that will the adoption of N4U in a clinical diagnostic public health context.

NeuGRID for you: expansion of NeuGRID services and outreach to new user communities – RI

