D3.3 Niche Modelling Services

Disclaimer

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Deliverable Documentation

About the Deliverable

One objective of the EUBrazilOpenBio Project is to provide, through the aggregation of various computational and data technologies, a coherent and integrated research environment to be used by scientists and external applications, particularly from the area of biodiversity. One such activity is *Ecological Niche Modelling*, also known as *environmental niche modelling[1]* or *species distribution modelling*, which involves applying computer modelling algorithms that combine geospatial occurrence data of a given species with environmental data (such as temperature and precipitation) to produce a species potential distribution map. The importance of such research can be seen when considering that this might help scientists to predict the impact of, for example, global climate change on the dispersion of species, or to identify species that may become threatened with extinction. Not only would this information influence research priorities for future conservation studies but it is likely to have a significant impact on political decisions taken by governmental agencies and the international community.

To implement such a niche modelling service on the physical EUBrazilOpenBio infrastructure being deployed and operated in WP4, software development will focus on a variety of aspects in number of key areas, respecting the requirements identified for Use Case II in D.2.1 (Use Case Requirements Specification):

1. Virtual Research Environment: The software developed should present an online, web based, research workspace where scientists can easily specify the ecological niche modelling experiments they require carried out on the infrastructure and, when available, visualise the results;

2. Data Management: Software should implement services to provide seamless acquisition of species occurrence data and relevant environmental information in acceptable time frames and in different formats;

3. Job Management: Software in this area should be able to orchestrate and distribute jobs (experiments) to appropriate resources within the EUBrazilOpenBio infrastructure, taking into consideration issues such as available capacity and data locality. Just as in the case of data management, software to support integration and interoperability between adopted technologies will be necessary (e.g. between gCube services and openModeller OMWS, between VENUS-C and openModeller, etc.);

4. openModeller: Alterations and performance enhancements are expected to be made in the niche modelling tool, openModeller, to help facilitate its exploitation on the distributed infrastructure (including parallelisations where considered necessary – see Performance Profiling Report for openModeller). Extensions, such as the inclusion of new versions of modelling algorithms (e.g. OM MAXENT), will also be incorporated.

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[1] http://en.wikipedia.org/wiki/Environmental_niche_modelling

Structure of the Deliverable

This deliverable is implemented as an online software repository that contains the software and documentation developed by Tasks 3.3 and 3.4, in accordance with the requirements identified in Tasks 2.1, 2.3 and 3.2, to provide niche modelling services on the EUBrazilOpenBio e-Infrastructure. This deliverable is thus expected to be **continuously updated** and implemented by relying on a tool that enables the list of software artefacts to be updated dynamically, providing users with the latest version of what has been released and developers with a history of changes. The deliverable can also be visualised through a wiki that links the software artefacts residing in the software repository and the related documentation. It is available as an extension ("Software Products" section) of the Wiki page initially created for D3.1:

http://wiki.eubrazilopenbio.eu/index.php/Development_Planning_and_Coordination

The decision to go for a single page was driven by the goal to provide the user with a single point of access to the plan governing software development as well as to the on-going results of this activity.