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Camille Maumet, Xavier Rolland, Axel Bonnet, Sorina Camarasu-Pop, Argiro Kokogiannaki, Christian Barillot

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Open research: linking the bits and pieces with OpenAIRE-connect

1. Camille Maumet, Univ Rennes, Inria, CNRS, Inserm, Rennes, France
2. Xavier Rolland, Univ Rennes, Inria, CNRS, Inserm, Rennes, France
3. Axel Bonnet, Univ Lyon, INSA-Lyon, Université Claude Bernard Lyon 1, UJM-Saint Etienne, CNRS, Inserm, CREATIS UMR 5220, U1206, LYON, France
4. Argiro Kokogiannaki, Athena Research Center, Athens, Greece
5. Sorina Pop, Univ Lyon, INSA-Lyon, Université Claude Bernard Lyon 1, UJM-Saint Etienne, CNRS, Inserm, CREATIS UMR 5220, U1206, LYON, France
6. Christian Barillot, Univ Rennes, Inria, CNRS, Inserm, Rennes, France

Introduction
Open research is growing in neuroimaging. The community — supported by funders who want best use of public funding but also by the general public who wants more transparent and participatory research practices — is constantly expanding online resources including: data (e.g. [1–3]), code (e.g. [4]), materials (e.g. [5]), tutorials, etc. This trend will likely amplify in the future and is also observed in other areas of experimental sciences. Open resources are typically deposited in dedicated repositories that are tailored to a particular type of artefact (e.g. [6,7]). While this is best practice, it makes it difficult to get the big picture: artefacts are scattered across the web in a multitude of databases. Although one could claim that the publication is here to link all related artefacts together, it’s not machine-readable and does not allow searching for artefacts using filters (e.g. all datasets created in relation with a given funder). Here, we present OpenAIRE-connect, an overlay platform that links together research resources stored on the web: https://beta.ni.openaire.eu/.

Methods
Within the OpenAIRE-connect project, we developed, set up and made available an online dashboard to:

- Search: Look for research artefacts by funder, project, publication date, access mode, type, language, content provider or free text.

- Share: Deposit research artefacts (publication, code, data, etc.) in relevant existing repositories (e.g. institutional archives for publications; Zenodo for code)

- Monitor: View statistics about open research artefacts by type and funders.

Additionally logged in users can:

- Link: Select existing research artefacts, funders and/or communities and link them together.

Additionally administrators can:

- Customize display of the dashboard

- Specify content providers.

Source code: https://svn-public.driver.research-infrastructures.eu/driver/dnet40/modules/uoa-connect-portal/trunk

Results
The portal is currently released in beta (https://beta.ni.openaire.eu/) and contains a total of: 22 060 publications, 789 datasets, 86 software, 1 735 other research products, 9 projects and is linked to 6 content providers.
Use case 1: linking artefacts related to a publication

It is more and more widespread among researchers to release analysis code and the datasets that were used in a publication. With OpenAIRE, authors can link those together and have a single entry point for all the publication resources (cf. fig. 1).

Use case 2: searching for artefacts related to a funded project

Researchers are often asked to write up report summarizing all the research outputs generated by a funded project. With OpenAIRE-connect they can have a single page summary where all contents related to a certain project can be found easily and quickly (e.g. fig. 1 includes a report for the project entitled “Enhancement of the 1000 Functional Connectome project”).
A. Publication Page

Objective Evaluation of Multiple Sclerosis Lesion Segmentation using a Data Management and Processing Infrastructure

Publishers: Cold Spring Harbor Laboratory

Subject: open science, life sciences, bioengineering, image segmentation, multiple sclerosis, life sciences, neuroscience and cognition, distributed computing

We present a study of multiple sclerosis segmentation algorithms conducted at the international MICCAI 2016 challenge. This challenge was

B. Project Page

Enhancement of the 1000 Functional Connectome Project (1R03MH096321-01A1)

Funding: National Institute of Mental Health

Start Date: 2012-01-16
End Date: 2013-11-30

Open Access mandate for Publications: no
Open Access mandate for Research Data: no

Organisation: Nathan S. Kline Institute for Psychobiology

List of resources (Publications, Software, Research Data, etc) generated by the project

Fig. 1: Example of pages on the OpenAIRE-connect portal: publication page (A) and project page (B).
Use case 3: adding new artefacts to the portal

The neuroinformatics portal on OpenAIRE lists all the research artefacts related to the neuroscience community. With OpenAIRE, users can add artefacts to a community. To do so, they can either use the resource page and add a link with the community (similarly to the procedure used to link related content as shown on fig. 1), or they can go to the link page, where they first choose a community and then search for the resource they want to link to these communities (fig. 2).

Once an artefact has been added to a community, it can be accessed through the community’s search engine, which also allows them to filter the data they are looking for by specific criteria (year of publication, language, etc) (fig. 2).
A. Search Page

Fig. 2: Search page where users can browse and filter publications (A).

B. Link Page

Fig. 2: Link page where users can associate a resource to other resources (e.g. a paper to analysis code) (B).
Conclusions

We have introduced OpenAIRE-connect, a new overlay platform to: search, share, monitor and link open research resources. We hope that this platform will support researchers and funders in getting a better understanding of the open resources landscape and that, in the future, this will lead to more data reuse and collaborative research.

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