The Second National Roadmap for Open Science and Research Software

Open Science | Research Software

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Topics

- The french roadmap for Open Science
- The roadmap & research software
- A concret example
- Local policy

The French Roadmap for Open Science

The French Roadmap for Open Science

- Coherent and dynamic policy in the field of Open Science
- First Roadmap announced in 2018 by the Minister of Higher Education, Research and Innovation
- Coordinated by the Committee for Open Science (CoSO)
- The second roadmap has been released in 2021: https://www.ouvrirlascience.fr/second-national-plan-for-open-science/

Strategic issues

- **Innovation** – Open up data, algorithms and source codes to encourage their re-use by researchers, teachers, citizens, public and private organisations and society as a whole.
- **Confidence** – Increasing the openness of data, algorithms and source codes to make public action more transparent.
- **Simplification** – Using data circulation as a tool to simplify administrative actions and processes and make them more efficient.

Action paths

- Generalising Open Access to publications
- Structuring, sharing and opening up research data
- Openening up and promoting source code produced by the scientific research
- Transforming practices to make Open Science the default principle

The Roadmap and Research Software

The Roadmap and Research Software

- Software plays a key role in scienfitic research
- The software needs to be available, with the possibility to be modified, reused and disseminated (FAIR principles)
- Ensure reproductibility of scientific findings
- Support the creation of new knowledge
- Making the digital processing understandable
- Increase the visibility and contributions

Objectives

- Creation an ecosystem that connects code, data and publications
- Increase the visibility of software and recognise its contribution to research
- Management of the coordination at the national and international level

Measures

- Recognize and support the dissemination under an open source license of software produced by publicly funded research programmes
- Highlight the production of source code from higher education, research and innovation
- Encourage crossovers between Open Science and artificial intelligence

Define and promote Open Source software policies (1)

- Produce a National Charter for Open Software coming from higher education and research
- Develop the link between data and software through a network of CDO in the universities and research performing organizations
- Produce recommendations for funding bodies to improve the support of software development

Define and promote Open Source software policies (2)

- Improve the skills of in relation with the development of economic models associated to Open Source software
- Support Software Heritage and recommend it for the archiving and referencing of source code

Coordinate the communities

- Create a College of Experts for source code and software within the CoSO
- Establish a long-lasting link between the CoSO and Open Software Task Force at the French Interministerial level
- Establish a link with national and international stakeholders (i.e.: RDA, FORCE11, EOSC, Rearch Software Alliance)

Build an ecosystem that connects code, data and publications

- Influence the adoption for a policy of open source software associated with the articles
- Coordinate between software forges, open publication archives, data repositories and the scientific publishing sector
- Propose standardising the Software Heritage Identifier (SWHID)

A Concret Example

A Concret Example

- The roadmap is a top-down approach
- Its application at the laboratory level may not be very clear
- Number of actions, relatively easy to put in place, enabling you to comply with this roadmap:
  - Licensing
  - Documentation
  - Software repository
  - Publications

Mychem

- Mychem is a chemoinformatics extension for MySQL and MariaDB
- Based on the User-Defined Function (UDF) mechanism
- Provides a set of functions that permits to handle chemical data within the database

https://mychem.github.io

License

- The choice of the license driven by the license of the main dependency: OpenBabel
- Mandatory to use the GPL v2 license
- Hard to modify a license once it is applied
- Requires the agreeement of all developpers
- Easy to set up:
  - Add a LICENSE file at the root of your project
  - Add a dedicated header in your code

License

```
/*************************************************************************
 *   Copyright (C) 2009-2019 by CNRS and University of Strasbourg        *
 *                                                                       *
 *   This program is free software; you can redistribute it and/or modify  *
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 *   (at your option) any later version.                                 *
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 *   This program is distributed in the hope that it will be useful,       *
 *   but WITHOUT ANY WARRANTY; without even the implied warranty of        *
 *   MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  See the         *
 *   GNU General Public License for more details.                        *
 *                                                                       *
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 *   along with this program; if not, write to the                       *
 *   Free Software Foundation, Inc.,                                     *
 *   51 Franklin Street, Fifth Floor, Boston, MA  02111-1301, USA.       *
 *************************************************************************/
```

Hosting

- The choice of a software forge is not that easy
- Important to use versionning tools like git
- Many choices:
  - Gitlab by Unistra: https://git.unistra.fr
  - Gitlab by IN2P3: https://gitlab.in2p3.fr
  - Sourcesup by RENATER: https://sourcesup.renater.fr
  - Github by Microsoft: https://github.com
  - Gitlab by Gitlab Inc.: https://gitlab.com
  - Your own repository ...

Hosting

- Mychem is hosted at Github : https://github.com/mychem/mychem-code
- Permits external contributions (including from private sector)
- Valuable tools
- Can be easily migrated to other repository if necessary
- Crawled by Software Heritage

Zenodo

- General-purpose open repository
- Developped by OpenAIRE
- Allow deposit of research papers, data sets, research software, ...
- Permit to get a persistent digital object ideintifier (DOI)
- Interconnected with Github, through the GA mechanism

Zenodo

- DOI automatically available for each release and for the project: DOI 10.5281/zenodo.4557896
  https://zenodo.org/doi/10.5281/zenodo.4557895
- Gives your code citation examples

Additional documents

- An extensive documentation is available
- Released under an Open license
- A Software Management Plan (SMP) is also available:
  https://dmp.opidor.fr/plans/5940
- Based on the Presoft SMP template

Work in progress

- Compatibility matrix between Linux distributions, OpenBabel and MariaDB
- Creation of a new release
- Publishing a code paper
  https://openresearchsoftware.metajnl.com/
- Adding the codemeta 2.0 description
  https://codemeta.github.io/codemeta-generator/

A Concret Example

Codemeta 2.0


```
{
    "@context": "https://doi.org/10.5063/schema/codemeta-2.0",
    "@type": "SoftwareSourceCode",
    "license": "https://spdx.org/licenses/GPL-2.0+",
    "codeRepository": "https://github.com/mychem/mychem-code.git",
    "dateCreated": "2010-07-06",
    "datePublished": "2010-07-06",
    "dateModified": "2021-02-21",
    "downloadUrl": "https://github.com/mychem/mychem-code/archive/refs/tags/1.0.1.tar.gz",
    "issueTracker": "https://github.com/mychem/mychem-code/issues",
    "name": "Mychem",
    "version": "1.0.1",
    "identifier": "https://doi.org/10.5281/zenodo.4557895",
    "description": "Mychem is a chemoinformatics extension for MySQL and MariaDB. It provides a set of functions tha
t permits to handle chemical data within the database. These functions permit to search, analyze and convert chemica
l data.",
    "applicationCategory": "Chemistry",
    "programmingLanguage": [
        "C",
        "C++"
    ],
    "operatingSystem": [
        "Linux",
        "MacOS X",
        "Windows"
    ],
    "softwareRequirements": [
        "OpenBabel"
    ],
    "author": [
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            "@id": "https://orcid.org/0000-0002-7067-5009",
            "givenName": "Jérôme",
            "familyName": "Pansanel",
```

Local Policies

Local Policies

- Support the implementation of the national roadmap in line with partner policies
- Promoting the use and development of open source software for scientific research
- Supporting the opening of research codes through the « Atelier de la Donnée » (ADELE Helpdesk)
- Ongoing discussions about a catalogue of open source software developed by the research units or the University

Questions?