



Cités, Territoires, Environnement et Sociétés
CNRS-Université de Tours

L A T

Laboratoire Archéologie et Territoires

Post-doctoral offer

PUBLICATION OF ARCHAEOLOGICAL DATA IN THE LINKED OPEN DATA

Research unit:

- UMR 7324 CITERES-Laboratoire Archéologie et Territoires (LAT), University of Tours, CNRS.

In collaboration with:

- EA 6300 Laboratoire d'Informatique (LI), University of Tours.
- Intelligence des Patrimoines, UMR 7323 CESR, University of Tours, CNRS.

Location: Tours (France)

Duration: 12 months (2018-2019)

Remuneration: 2200€ / month (net pay)

Objectives

The aim of this international one year long post-doctoral project is to generalize the LAT's archaeological data publication in the Linked Open Data (LOD), as a proof of concept for the French archeological community. This interdisciplinary project is conducted in collaboration with the computer science laboratory (LI) and the center for the Renaissance study (CESR) of the University of Tours, which leads the Intelligence des Patrimoines (I-Pat) program of the Centre-Val-de-Loire Region. This project achievements are intended to feed the I-Pat's digital platform. More generally, this post-doctorate project should contribute to the emergence of the "Heritage" domain in the Linked Open Data cloud.

In the archaeological community, it is noted that a significant amount of data remains difficult to access and run the risk of being lost. It is not fundamentally different from the other disciplines of the Humanities and Social Sciences. Besides, an originality of the archaeological practice is that it does not allow for the renewal of the experiment once the excavation has been carried out, and thus, the excavation archives value is increased, and archaeologists have even more responsibility when managing their data. The conservation of this mass of scientific data, by making it accessible, is fundamental for the knowledge of the heritages that these archives document, and for the memory of the discipline itself. Archeological data publication and sharing will inevitably be digital.

The program of urban archaeology initiated in Tours in 1970 is emblematic, as it offers a homogeneous documentation, the structure of which was preserved during the information system digitizing. The aim is to open it to the LOD. Published data in the LOD is characterized by a five-star rating (Five stars Linked Open Data), set up by Berners-Lee in 2010 to assess the quality of a data set in terms of accessibility and usability on the semantic web level. This scale goes from accessibility (online), structuring, the use of non-proprietary and standard formats, to data interlinking (interoperability). Today, CITERES-LAT has several databases, each at a different stage of development towards interoperability, depending on when they were designed. Our goal is not to homogenize them, but to make them interact, with each other and with others, so that they can be queried together without altering their initial users' habits.

The first step in this process is to align the content of these databases with shared and standardized vocabularies (PACTOLS, multilingual thesaurus set ISO 25964-1:2011). The next step is to move to a higher level of abstraction in order to allow cross-examination of systems with different granularity of entities and descriptors. To match the used data structures and terminology, we use CIDOC-CRM (ISO 21127:2014), which is the domain ontology for heritage data, developed by the CRM Special Interest Group, chair by the ICS-FORTH team in Heraklion with which a collaboration is being undertaken. Then, based on the expertise of Béatrice Markhoff (LI), in collaboration with the University of Bozen-Bolzano (Italy), the choice we made is to set up

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a software architecture, composed of several bricks, for a dynamic interrogation of the existing information systems via the ontology (CIDOC CRM). We do not transform, extract and load our legacy data into data warehouses (triplestores).

The work already carried out has demonstrated the feasibility of this architecture based on the exhibition of the ArSol system (Archives du Sol <http://arsol.univ-tours.fr/> and <http://citeres.univ-tours.fr/spip.php?article505>). This first proof of concept forms the basis for this project, the objective of which is of course to make all our information systems interoperable by this means, but also to demonstrate interoperability to the archaeological community by showing how several systems of different formats, structures and granularities can be cross-examined from an ontological level.

Contribution of the theme to national and international outreach, partnerships and scientific networks

This project will make it possible to extend the scope of the already carried out experiments, by bringing them up to national and European infrastructure levels, in place or in the process of being set up, and by creating archaeological data sources in the Linked Open Data cloud.

The ambition is to demonstrate that the web exhibition of structured and interpreted information makes it possible to envisage their use and reuse by opening up new research perspectives. Beyond that, the challenge is to link scientific publications with data, by exploring the new perspectives offered by ontological inferences. The post-doctoral fellow will contribute to the regional research by participating in the heterogeneous data platform currently being built by Program *Intelligence des patrimoines (I-Pat)*. He or she will benefit from the inclusion in the national network of the consortium *Mémoire des Archéologues et des Sites Archéologiques (MASA)* of the *TGIR Huma-Num*, led by X. Rodier (CITERES-LAT) for the MSH Val de Loire from 2017 to 2020. In addition, his or her achievements will contribute to two European projects: ARIADNE, Advanced Research Infrastructure for Archaeological Dataset Networking in Europe (7th FP7), by supplying its portal (<http://portal.ariadne-infrastructure.eu/>) with the published data, and PARTHENOS, Pooling Activities, Resources and Tools for Heritage E-research Networking, Optimization and Synergies (H2020), to which the MASA consortium contributes via the TGIR Huma-Num.

Finally, this project is also part of the COST Saving European Archaeology from the Digital Dark Age project, SEADDA, submitted to the European Union in September 2017.

Supervision

The post-doctoral researcher will be welcomed in CITERES-LAT at the MSH Val de Loire where he or she will have an office and a computer equipped with the necessary softwares. He or she will work in collaboration with the members of the laboratory who develop, manage and publish information systems: Philippe Husi (IR CNRS, HDR), Olivier Marlet (IE CNRS), Xavier Rodier (IR CNRS, HDR). He or she will benefit from the work carried out using the ArSol information system in collaboration with Béatrice Markhoff (MCF HDR) from LI, for the publication of ArSol in the Linked Open Data. Finally, he or she will ensure that these works are in line with the digital platform for *Intelligence des Patrimoine,s* coordinated by Perrine Thuringer (IR I-Pat).

Applications must be sent to xavier.rodier@univ-tours.fr before midnight on 1st January 2018, by e-mail with attached files.

The files must include

- A cover letter
- A curriculum vitae with a list of publications
- An extended abstract of the PhD thesis

Please contact Xavier Rodier for further information.