

France Life Imaging (FLI)-Information Analysis and Management (IAM) Provider of data storage and processing solutions for preclinical imaging studies

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France Life Imaging (FLI) - Information Analysis and Management (IAM)

Provider of data storage and processing solutions for preclinical imaging studies

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Abstract

Animal population imaging is a domain still in its infancy that requires a similar technical support as for human population imaging: technical solutions for storing and processing large volumes of data in a distributed scientific work environment. This challenge has been identified by the national French action FLI-IAM (<https://portal.fli-iam.irisa.fr>). IAM (Information Analysis and Management) is the computation science node of France Life Imaging (FLI). It provides access to multiple imaging databases and computation resources and takes care of the interoperability between databases¹ and processing pipelines (local or cluster-based platforms). The preclinical work group within FLI-IAM has especially worked on a solution for hosting preclinical imaging studies, that is called Shanoir² Small Animal.

We will present the FLI-IAM architecture (fig. 1) and detail our Small Animal Shanoir (SAS) solution for hosting preclinical imaging studies (fig. 2, 3): data storage and processing execution and results integration via VIP³/Boutiques⁴.

Shanoir Small Animal provides:

- Control over the distribution and sharing of data
- Manages study meta-data and preclinical images using a specific ontology
 - Pathology models, therapies, anaesthetics and physiological data
- Import of Bruker and DICOM file formats (additional formats will be supported to comply with the evolution of the ecosystem)
- Secures online data sharing and data reuse
- Provides a storage of all research data in the cloud
- Original images + processing (code) + processed results
- Processes preclinical images on high performance systems, if required
- Support to integrate your data analysis pipeline and algorithms
- Enriches data with links using DOIs to Open Access, e.g. OpenAIRE

Currently FLI-IAM works on a new version of Shanoir called Shanoir-NG, with a completely new technological stack and architecture based on micro-services. We will detail the features of this new version and show how sharing of data and starting of pipelines work.

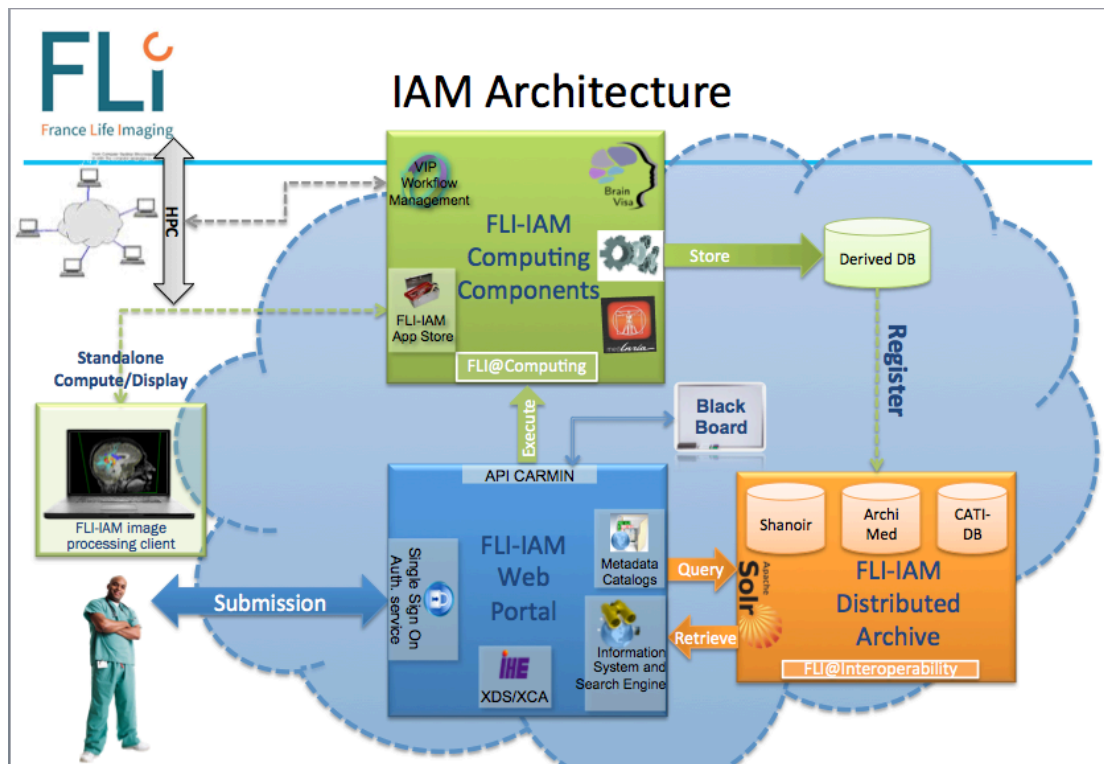


Figure 1. Architecture overview of FLI-IAM

The screenshot shows the 'shanoir' web interface. At the top, there is a navigation bar with 'Manage data', 'Import data', 'Administration', and 'Preclinical' menus. A user is logged in as 'ADMINISTRATOR ADMINISTRATOR'. The main content area is divided into three sections:

- Edit subject:** A form with fields for Name (bobby), Specie (rat), Strain (wistar), Biological type (wild), Provider (simon), and Stabulation (grenoble).
- Manage subject pathologies:** A table with columns: Pathology, PathologyModel, Location, Start Date, End Date, Edit, Delete. One entry is visible: Alzheimer (X38) in the Brain location. Below the table, it shows 'Selected: 0 | Found: 1 | Total: 1 | Page size: 20'.
- Manage subject therapies:** A table with columns: Therapy, Type, Dose, Dose Unit, Frequency, Start Date, End Date, Edit, Delete. One entry is visible: Chimo (Drug) with a dose of ml. Below the table, it shows 'Selected: 0 | Found: 1 | Total: 1 | Page size: 20'. There are 'Cancel' and 'Save' buttons at the bottom.

Figure 2. Shanoir-NG Small Animal, snapshot of the management of an animal subject

The screenshot displays the 'shanoir' web interface for configuring an examination. The top navigation bar includes 'Manage data', 'Import data', 'Administration', and 'Preclinical'. The main content area is titled 'Edit Anesthetic' and contains several form fields:

- Anesthetic ***: Dropdown menu set to 'Injection Iso. 6% Ket. 8mg/ml'
- Injection interval**: Dropdown menu set to 'During'
- Injection site**: Dropdown menu set to 'Caudal Vein'
- Injection type**: Dropdown menu set to 'Infusion'
- Dose**: Text input field containing '5'
- Dose Unit**: Dropdown menu set to 'ml'

Below the anesthetic section are three additional data sections, each with a 'File *' field and a 'Choose Files' button:

- Add extra data**: File * field with 'No file chosen'.
- Add physiological data**: Radio buttons for 'Heart Rate data', 'Respiratory Rate data', 'SaO2 data', and 'Temperature data', all set to 'No'. Includes a 'File *' field with 'No file chosen'.
- Add Blood gas data**: File * field with 'No file chosen'.

Figure 3. Shanoir-NG Small Animal, snapshot of an examination

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