Brainomics: A management system for exploring and merging heterogeneous brain mapping data
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Number of large datasets for brain mapping have been released [1, 2].

Neuroimaging datasets more routinely include clinical data or genetics data.

Exploitation requires:
- An efficient organization to integrate all the measures
- An easy access to the relevant information.

Neuroimaging [3] and genomics [4] databases are dedicated to their own field of research.

**Introduction**

- **Data management framework**, 10 years of industrial uses (e.g. [5]).
- **Well established core technologies**: SQL, Python, HTML5, Javascript.
- **Licensed under LGPL since 2005**.
- **Used in production environments since 2005**.
- **Fine-grained security system** coupled to the data model definition.
- **Migration mechanisms** controls model version / ensures data integrity.

**Conclusion**

- **Open source solution to manage brain imaging datasets and associated meta data.**
- **Powerful querying and reporting tool**, customized for emerging imaging-genetics field.

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**CubicWeb**

- **http://www.cubicweb.org/**
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**Data model**

- Described in Python, using reusable modules called “cubes”.
- Modellisation of Scans, Questionnaires, Genomics results, Behavioral results, Subjects and Studies information.
- Data model optimized for large volumes (> 2000 subjects).
- Tested with several publicly available datasets [1, 2].

**Query using RQL**

- Similar to the W3C’s SPARQL [6].
- Supports the basic operations (selection, insertion, etc.).
- Subquerying, ordering, counting, ...

Query all the Cmap scans of subjects with an age greater than 25, and that have a score greater than 4.0 for the “algebre” question

Any SA WHERE S is Subject, S age > 25, X is QuestionnaireRun, X concerns S, A is Answer, A questionnaire_run X, A question Q, Q text “algebre”, A value > 4, SA is Scan, SA concerns S, SA type “c map”

Views

- Each query result can be seen using different views.
- HTML pages, ZIP files, spreadsheets, XCEDE XML, ...
- May include processing (stat. maps computed on the fly).