

Master's thesis proposal

*Combining intension and extension in OLAP  
query recommendation*

Proposed by Marie-Aude Aufaure, Patrick Marcel, Stefano Rizzi,  
Yves Vanrompay

## Context and objectives

In Business Intelligence systems, users interact with data warehouses by formulating OLAP queries aimed at exploring multidimensional data cubes. Recommending interesting queries to users can improve the efficiency of OLAP sessions by proactively guiding users in data exploration and improving the quality of their interactive experience.

Current OLAP query recommendation techniques include intension-based approaches [1], where only query expressions are considered for computing recommendations, and extension-based approaches [2], where query results are analyzed for computing recommendations.

The aim of this thesis is to study how to combine an intension-based technique with an extension-based one. In particular a balance between the computational efficiency of intension-based techniques and the effectiveness of extension-based techniques in computing suitable recommendations will be sought.

A starting point for this thesis will be:

- The approach proposed in [1], where the past queries of a user are clustered to derive a Markov-based model of the user behavior, to predict the most likely queries the user will formulate next given the current query.
- The approach proposed in [3], where previous queries in a current session are leveraged to find the information that the user could not correctly extrapolate from the previous answers she got.

## Organization

The thesis will be jointly supervised by:

- Marie-Aude Aufaure and Yves Vanrompay (MAS Laboratory, Ecole Centrale Paris, France),

- Patrick Marcel (LI laboratory, Université François Rabelais de Tours, France),
- Stefano Rizzi (DISI, University of Bologna, Italy)

The trainee will be hosted at Ecole Centrale Paris and regular working sessions with all the supervisors will be organized. The thesis starts in February 2014. The trainee is expected to write a report and defend her/his work no later than late July 2014.

The trainee is expected to:

1. Review the bibliography on the domain. A written survey is expected before late March 2014.
2. Propose an approach for the combination of intension-based and extension-based techniques. A report is expected before late May 2014.
3. Implement the proposed approach.
4. Depending on the state of achievement, contribute to the writing of a research article for submission to an international workshop.

## Application and contact

Applicants must have strong skills in BI in general and data warehouse, OLAP and data mining in particular. English proficiency is mandatory. Applicants must send a CV and a motivation letter to Yves Vanrompay ([yves.vanrompay@gmail.com](mailto:yves.vanrompay@gmail.com)) before the end of December 2013. Applicants may be contacted for an interview.

For further information on the thesis topic and overall organization, please contact Yves Vanrompay ([yves.vanrompay@gmail.com](mailto:yves.vanrompay@gmail.com))

## References

- [1] Marie-Aude Aufaure, Nicolas Kuchmann-Beauger, Patrick Marcel, Stefano Rizzi, and Yves Vanrompay. Predicting your next olap query based on recent analytical sessions. In *DaWaK*, pages 134–145, 2013.
- [2] Arnaud Giacometti, Patrick Marcel, Elsa Negre, and Arnaud Soulet. Query recommendations for olap discovery-driven analysis. *IJDWM*, 7(2):1–25, 2011.
- [3] Patrick Marcel, Rokia Missaoui, and Stefano Rizzi. Towards intensional answers to olap queries for analytical sessions. In *DOLAP*, pages 49–56, 2012.