



## Le Sommelier: A Prioritised Multi-Criteria Recommendation System For Wine Matching

### Overview

**Le Sommelier** is a recommendation system aiming to help users choose one or more different bottles of wine that pair nicely with their orders. This is a frequent issue met by restaurant customers who have no specialized knowledge on the subject, and requires the satisfaction of a **combination** of complex rules. Our system represents, to the widest extend possible, the expert's knowledge of the field in the form of both **strict** and **weak prioritized rules**. In addition to the formalization of general empirical knowledge, an important feature of the system is the utilization of **users' preferences**. The modeling of a complicated combinatorial problem in an accessible way and the execution of **reasoning** that can be fine-tuned with user-friendly defined **adjustments** based on the customer's or restaurateur's preferences and needs constitute our system's research contribution.

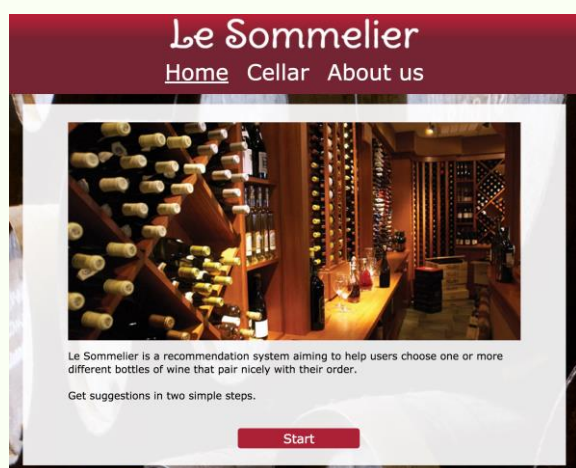


Fig.1 The home screen of Le Sommelier

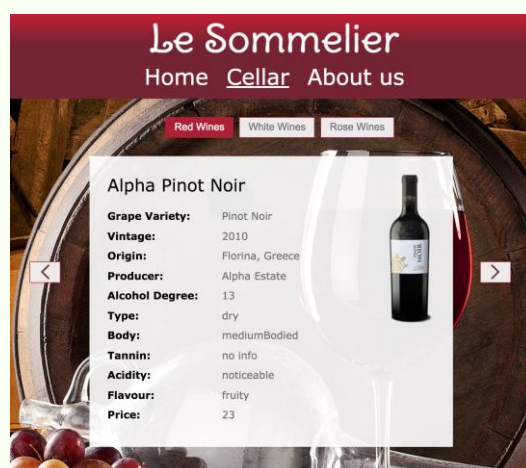


Fig.2 The cellar screen presents the wine list of the system, grouped by wine colour

### Target Domains

The system is suitable for application domains that require providing recommendations based on the satisfaction of weak and strict rules, e.g., recommendation systems, scheduling systems (task assignments, course timetabling), etc.

## Description

**Le Sommelier** is simple to use, since the interaction is mainly based on selecting options over the presented drop-down menus of the ordering page and button-based navigation (Fig. 3). The system supports orders by multiple users and its purpose is to find an optimal match of wines to all the ordered dishes and user preferences. It displays the wine suggestions in the central part of the screen, while the left part is occupied by the order information. Apart from the wine information, the suggestion part includes a justification generated by the system, which provides an explanation 'why' the specific wine is suggested, based on the activated rules (Fig. 4).

The modeling of the domain is based on the declarative language ASP and the reasoning is conducted with the Clingo tool. Initially, all available wines are considered, but gradually they are filtered with strict and weak rules so that they can be properly ranked. Strict rules impose exclusion of wines that do not match with the basic ingredient of an ordered dish or exceed the customer's budget. They also take into consideration other user preferences (e.g., preference for local wines). Weak rules are based on three rule categories, which represent general empirical rules often used by experts. By using priorities among the rule categories, the system aims to satisfy as many rule categories as possible, while suggesting wines as close to the customer's budget as possible.

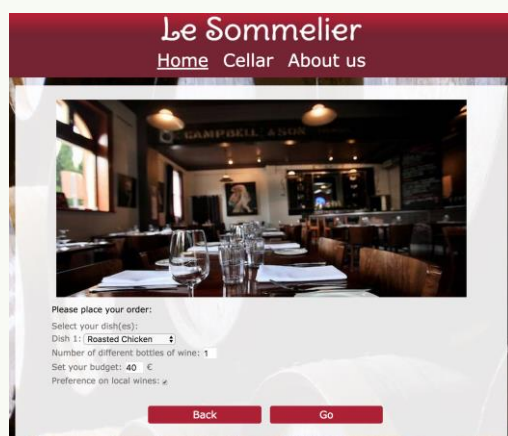


Fig.3 The ordering screen of Le Sommelier

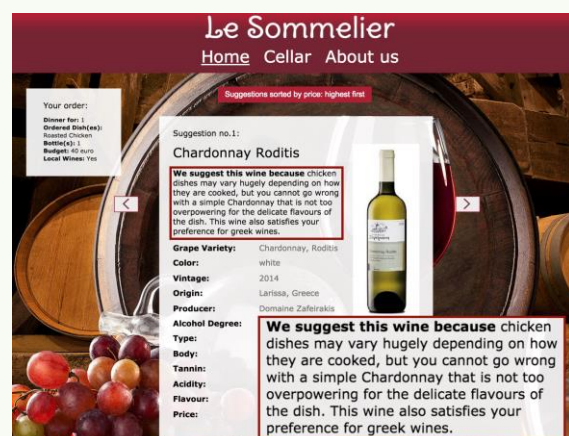


Fig.4 The suggestion screen of Le Sommelier

## Additional Information

A video demonstrating **Le Sommelier** system is available at:

<http://www.ics.forth.gr/isl/sommelier-video>

**Le Sommelier** is available at:

<http://www.ics.forth.gr/isl/sommeliers>



video

**Contact details:** Nikoleta Tsabanaki  
tsaban@ics.forth.gr  
[www.ics.forth.gr/isl](http://www.ics.forth.gr/isl)

Theodore Patkos  
patkos@ics.forth.gr

Dimitris Plexousakis  
dp@ics.forth.gr