

An Interactive Exploratory System with Real-Time Preference Elicitation

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Introduction Current proposals for preference-based information access [4] seem to ignore that users should be acquainted with the information space and the available choices for describing effectively their preferences. Furthermore, users rarely formulate complex (preference or plain) queries, because it is a laborious and difficult task for them. We will demonstrate a system for interactive exploration of multi-dimensional and hierarchical information spaces, enriched with actions that allow users to dynamically express their *preferences*, based on the preference framework described in [5]. Specifically, the system supports progressive preference elicitation, inherited preferences with scope-based resolution of conflicts, and preference composition over multi-dimensional and hierarchical information spaces. We argue that such functionality can ease the interaction and speed up the restriction of the focus to those parts of the information space that the user is interested in.

Preference enabled exploration The proposed interaction model can be implemented over a variety of exploratory methods like the interaction paradigm of *Faceted and Dynamic Taxonomies (FDT)* [2, 3]. We will demonstrate an implementation over a system for browsing and exploring RDF sources, described in detail in [1] (the fuzzy aspect is ignored). This system uses Jena¹, which is a Java framework for building Semantic Web applications. Our information base holds about 4036 cars and trucks, which are described by classes like `Manufacturer` and `Drive.System` (hierarchically organized), `Vehicle.Type`, and `Transmission`, as shown in Fig. 1. In this figure, continuous arrows denote *subClassOf* relationships while dashed arrows denote *typeOf* relationships.

The architecture of the system and its components is given in Figure 2. The preference actions are offered through HTML 5 *context menus*² and AJAX, which are enacted by right clicking in the browser window. The user is able to order classes, subclasses and objects using *best*, *worst* and *prefer to* actions (i.e. relative preferences), or actions that order them lexicographically or based on their count values. Regarding objects, since their number can be very large,

¹ <http://jena.apache.org/>

² Available only to firefox 8 and up.

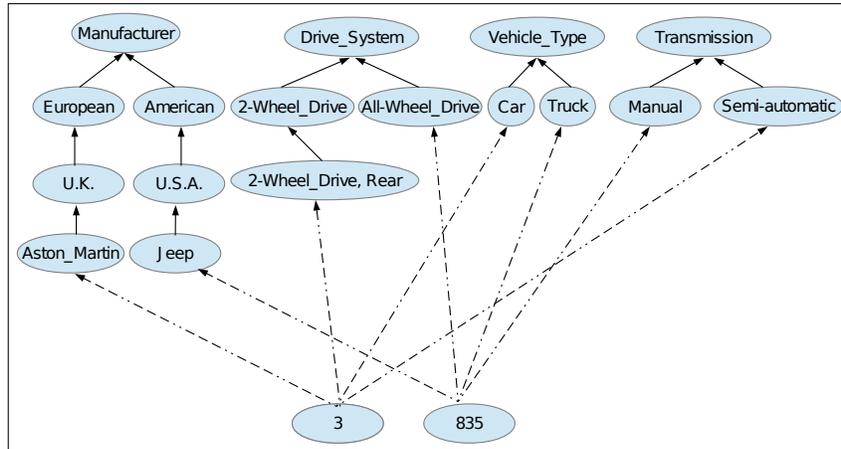


Fig. 1. The RDF Knowledge Base

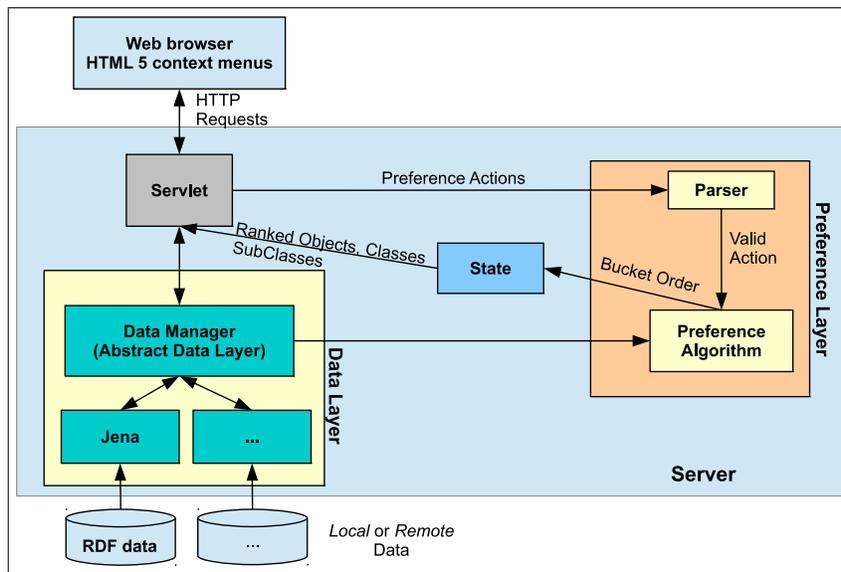


Fig. 2. The architecture of the system

the user is able to define a threshold, so that preferences are applied only when the number of objects is reduced under this specific threshold³. Furthermore, he can compose object scoped preferences anchored to classes, using *Priority*, *Pareto* and *Pareto Optimal* compositions. Composition is offered by defining the appropriate composition mode and selecting classes through the appropriate

³ The user can reduce the number of objects by navigating over the classes, subclasses, and objects and restricting his focus.

classes' context menus. Finally, the user is able to store and load his preferences, since exploration is a time depth process.

A number of screenshots of the system with the available options and indicative preference actions is shown below. Figure 3 depicts the available system options (i.e. composition, threshold, session store and load) and the expression of a simple preference action.

This demonstration focuses on the flexibility of the provided preference actions and how with a few actions the user can select the desired car from an information base of 4036 cars.

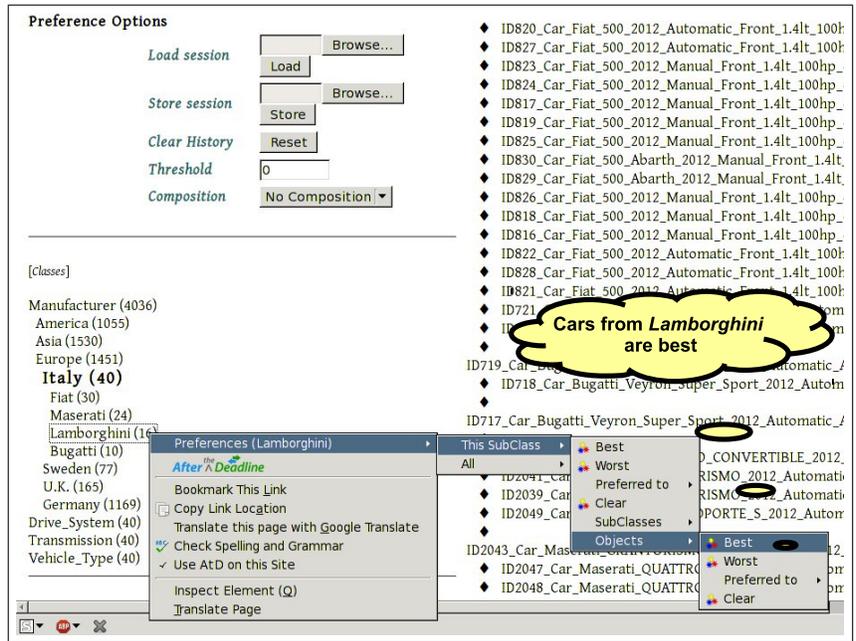


Fig. 3. Overview of the system options and a simple preference action (i.e. Cars from Lamborghini are best)

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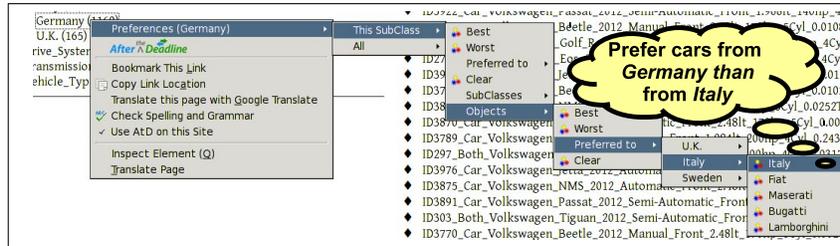


Fig. 4. Action to Prefer German to Italian cars

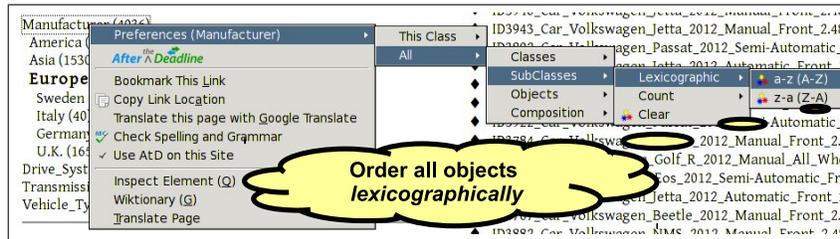


Fig. 5. Order all objects lexicographically in ascending order

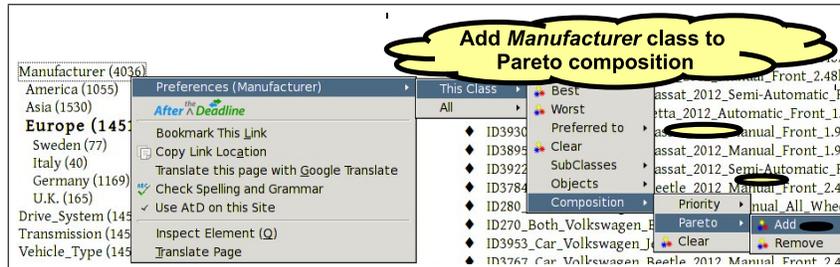


Fig. 6. Add Manufacturer class to Pareto composition

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