

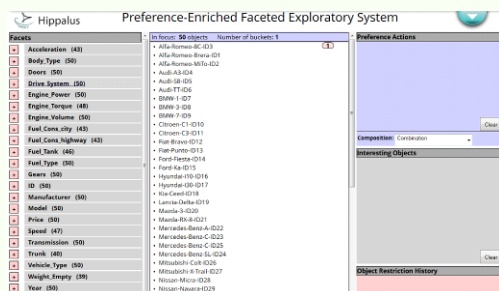


Hippalus: A system for Preference-aware Exploratory Search

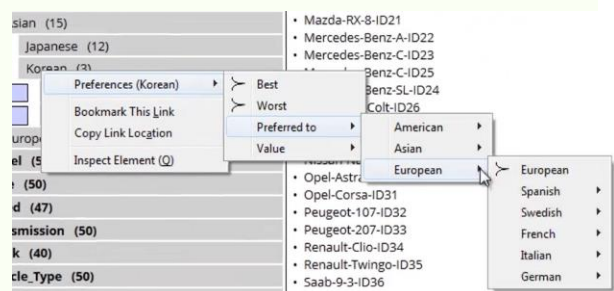
Overview

Hippalus is a publicly accessible web system demonstrating a preference-enriched exploratory process based on Faceted and Dynamic Taxonomies (FDT). The underlying preference framework allows expressing preferences over attributes (facets) whose values can be **hierarchically valued** and/or **multi-valued** and offers **automatic conflict resolution**. It offers actions that allows the user to order **facets**, **values**, and **objects** using **best**, **worst**, **prefer to** actions (i.e. relative preferences), **around to** actions (over a specific value), or actions that order them **lexicographically**, or based on their **values** or **count values**. Furthermore, the user is able to compose object related preference actions, using Priority, **Pareto**, **Pareto Optimal** (i.e. skyline), and **Combination** (i.e. order according to priority; the rest actions are the least prioritized and use **Pareto**) compositions. All the above functionality is offered in an efficient way. The information base that feeds **Hippalus** is represented in **RDF/S** (using a schema adequate for representing objects described according to dimensions with hierarchically organized values).

In a user based evaluation conducted over the **Hippalus** system the results were very satisfying: **all users completed successfully all tasks in 1/3 of the time and with 1/3 of the actions** in comparison to the plain FDT, where none of the users managed to successfully complete all users' tasks.



The initial screen of the Hippalus system



Expression of the **relative preference** "Korean preferred to European"

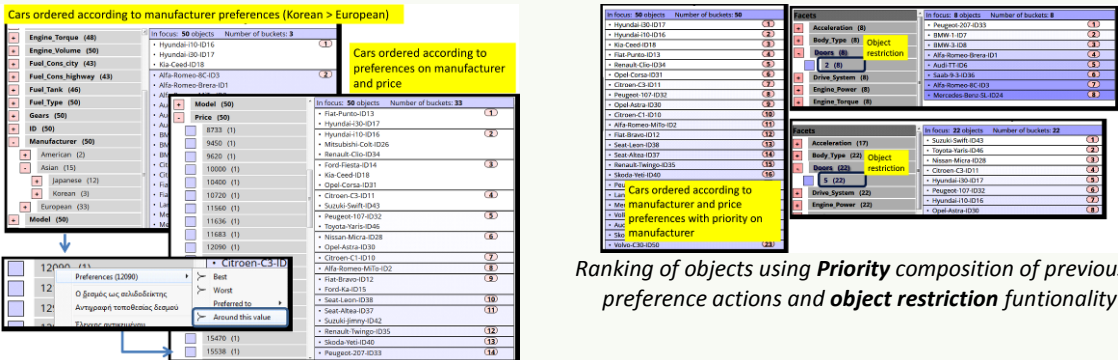
Target Domains

The system is suitable for application domains that require supporting exploratory search and decision making, e.g. e-commerce, professional search (medical search, patent search), etc.

Description

Hippalus displays the preference ranked list of objects in the central part of the screen, while the right part is occupied by information that relates to information thinning (object restrictions), preference actions history and preference composition. It offers the preference related actions through right-click activated pop-up menus (through HTML5 context menus). The design of the preference actions includes actions that are anchored to one element, and this makes the right click activated actions straightforward. Moreover, the proposed preference-based framework supports also actions that concern two elements, i.e., relative preferences like “*Korean preferred to European*”. The second figure shows how it can be expressed through a context menu: the action is anchored to *Korean* and the available menu guides the user through the options that are valid in this specific situation; it only shows options that are valid for the specific user focus. At any time, the user can restrict his focus to any hard constraint (i.e., the information thinning process), and his soft constraints (i.e., expressed preferences) will be applied to the restricted object set.

The enriched interaction is simple for the users, since it is mainly based on right clicks over the presented values, and the underlying preference framework is perfectly suited since it exploits the semantics of hierarchically organized values and resolves automatically conflicts. This reduces the number of preference actions that the users have to express and the dialogue is kept simple and clean (from technicalities).



The figure consists of three screenshots of the Hippalus interface. The left screenshot shows a preference composition window with a tree view of constraints like 'Engine_Torque', 'Fuel_Consumption', and 'Price'. A context menu is open over the 'Price' constraint, showing options like 'Best', 'Worst', 'Preferred to', and 'Around this value'. The middle screenshot shows a list of cars ranked according to manufacturer and price, with a yellow highlight on the top row. The right screenshot shows a list of cars ranked according to manufacturer and price with priority on manufacturer, with a yellow highlight on the top row. Below the screenshots is a caption: "A second preference action ("around to 12090" over the Price attribute) and preference ranking of objects using Combination composition".

A second preference action ("around to 12090" over the **Price** attribute) and preference ranking of objects using **Combination** composition

Ranking of objects using **Priority** composition of previous 2 preference actions and **object restriction** functionality

Additional Information

A video demonstrating the **Hippalus** system is available at:

<http://www.youtube.com/watch?v=Cah-z7KmlXc>

Hippalus is available at:

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



Hippalus video

Contact details: Yannis Tzitzikas
tzitzik@ics.forth.gr
www.ics.forth.gr/isl