Craigslist Price Recommendations

Ruiyang Ma, Zehang Weng, Zesen Wang, Zitao Zhang

Search Engines and Information Retrieval System Project

Background

Shopping online, people always have various demands on prices, conditions, etc. Also, the amount of products is too huge for users to find out what they exactly want. Therefore, it's essential for an intelligent search engine to provide users better shopping experience.

The purpose of this project is to create an overview of the expected price for objects on the second-hand market. The deployed system has several novel functions, like search with options, spell check, statistic visualization, smart recommendation system, image retrieval.
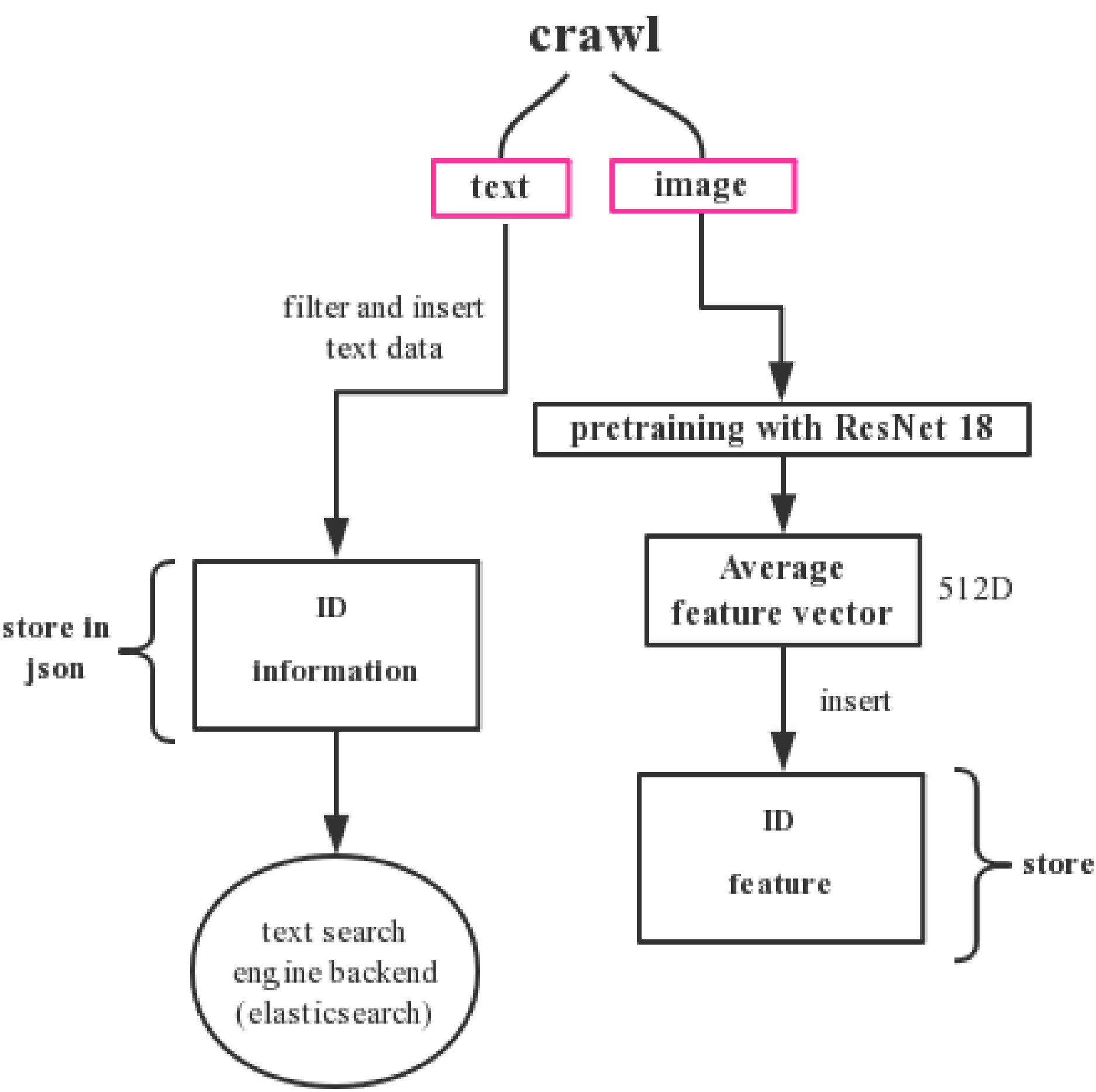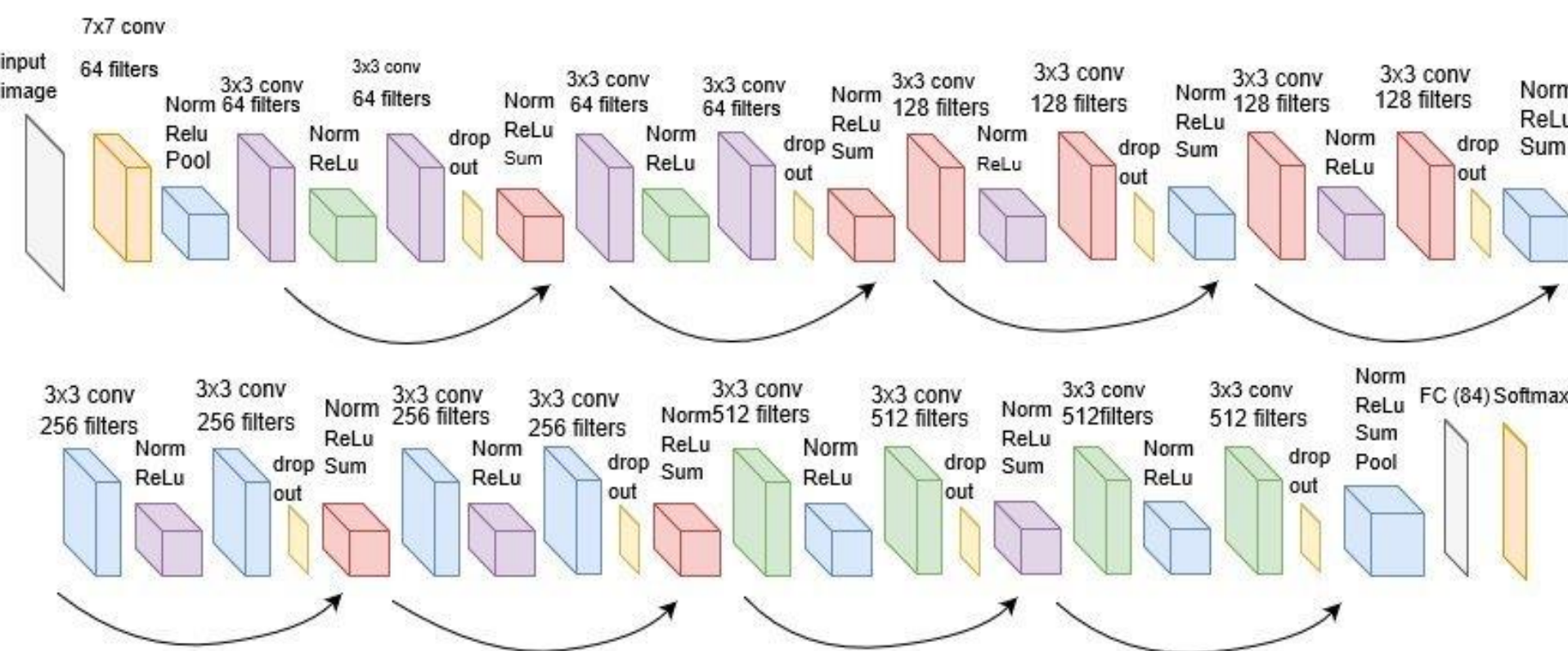
Structure
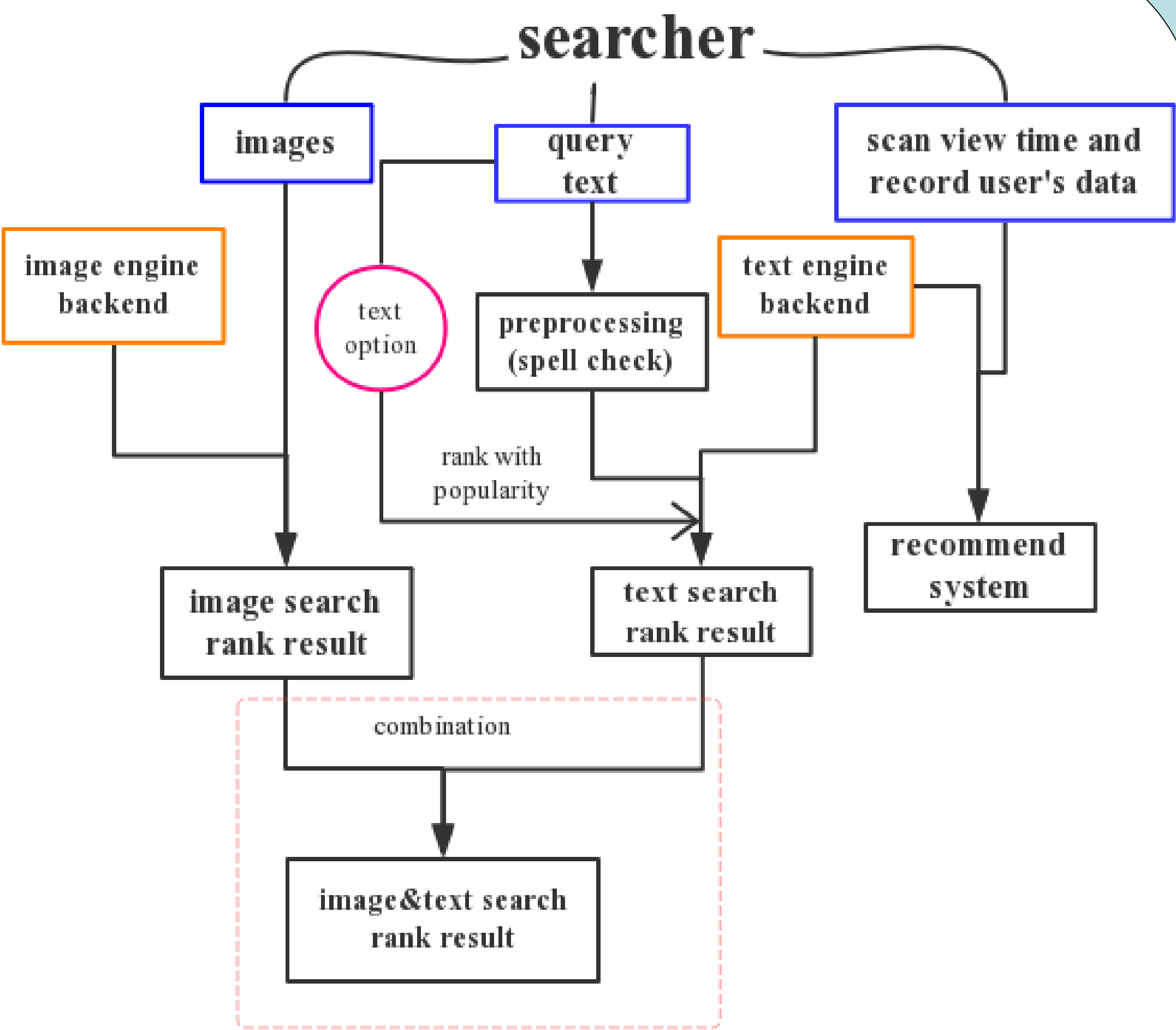

Figure 1 Crawl

Figure 2 ResNet

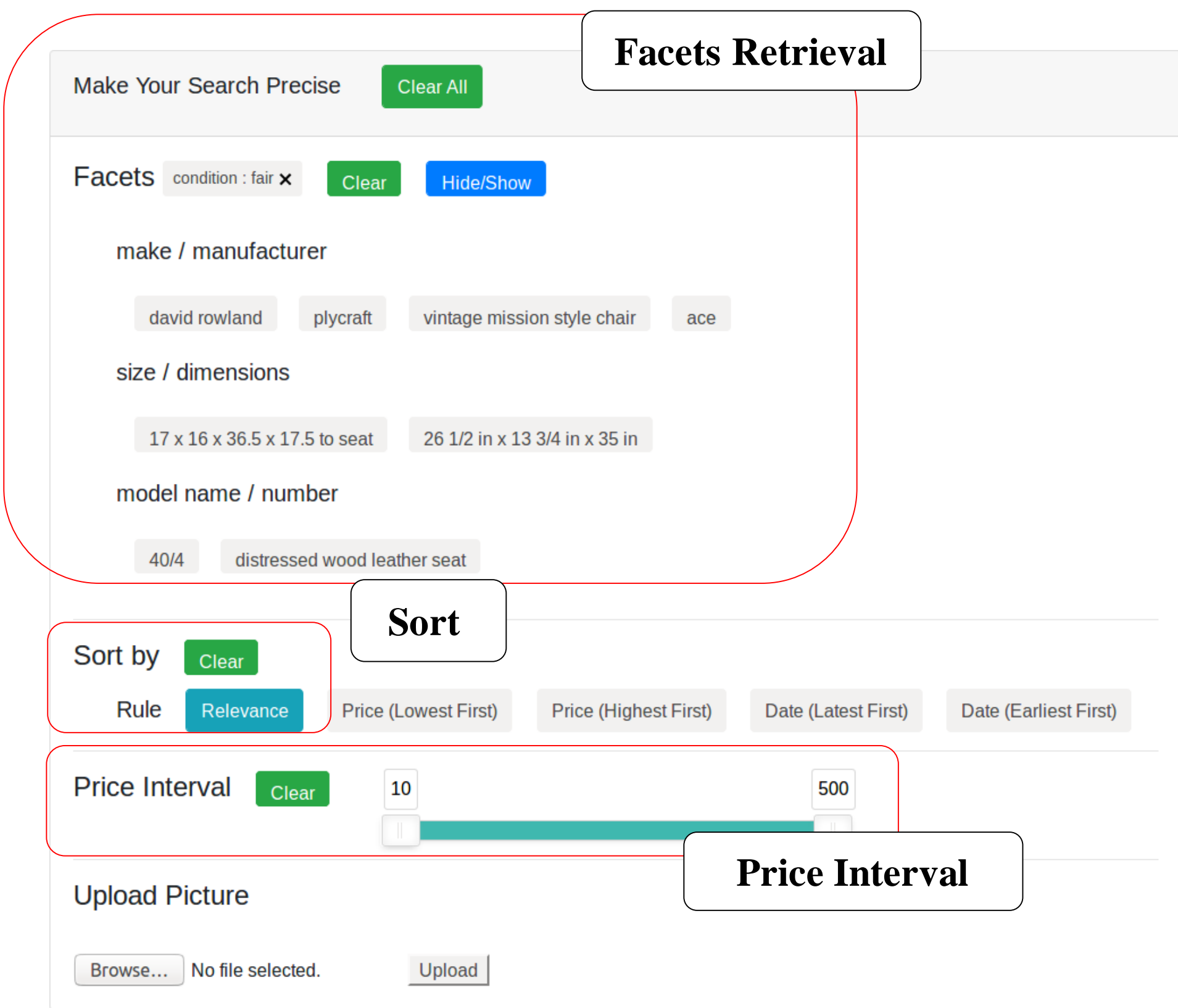**Figure 3 Brief Flow Chart**

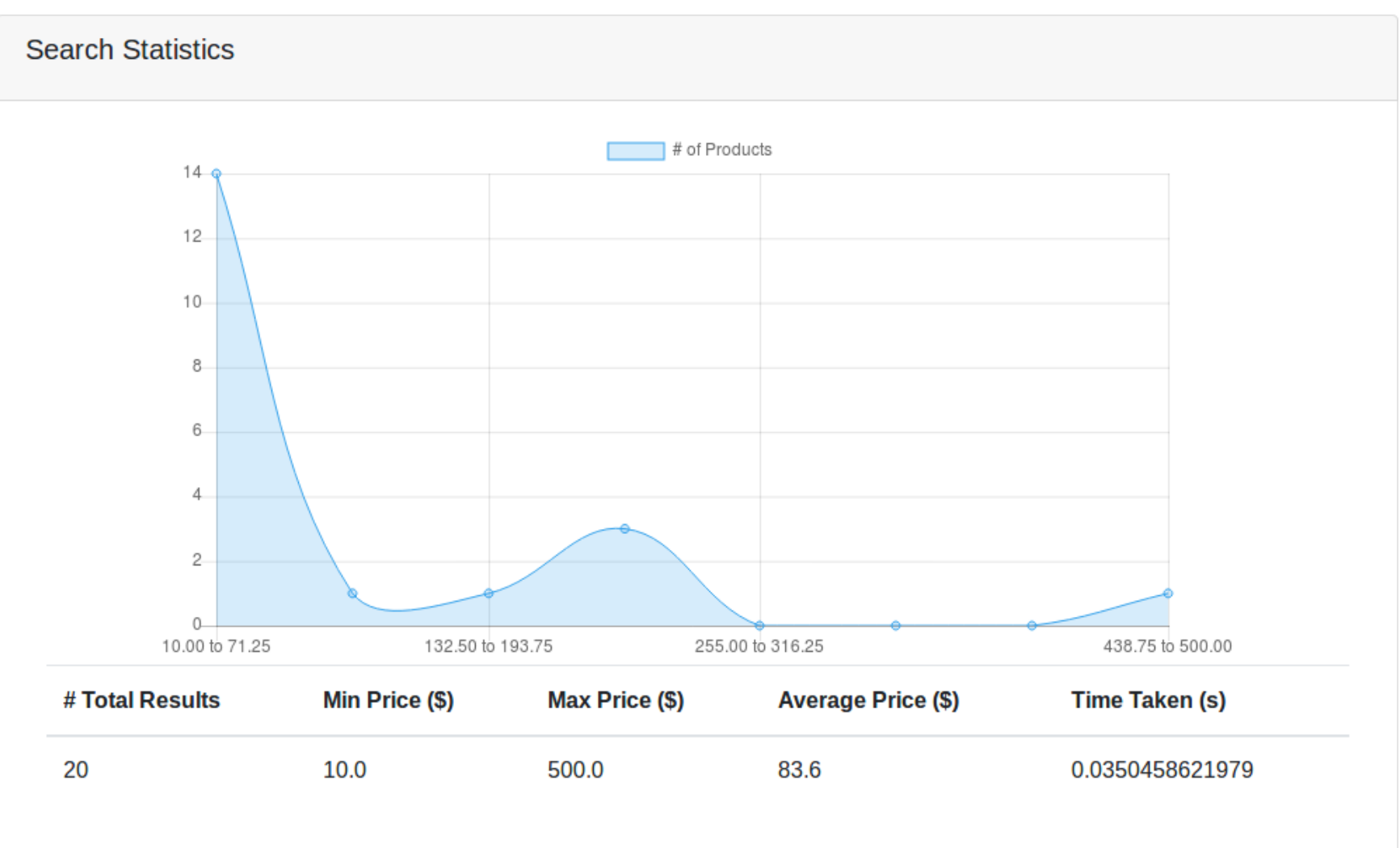## Product Search

Figure 4 User Interface

Figure 5 Search Statistics

We implement a price interval filter that enables users to select their ideal price intervals.

Some statistics (total number of results, minimal price, average price, etc.) also provide users a clearer view of the product they search.
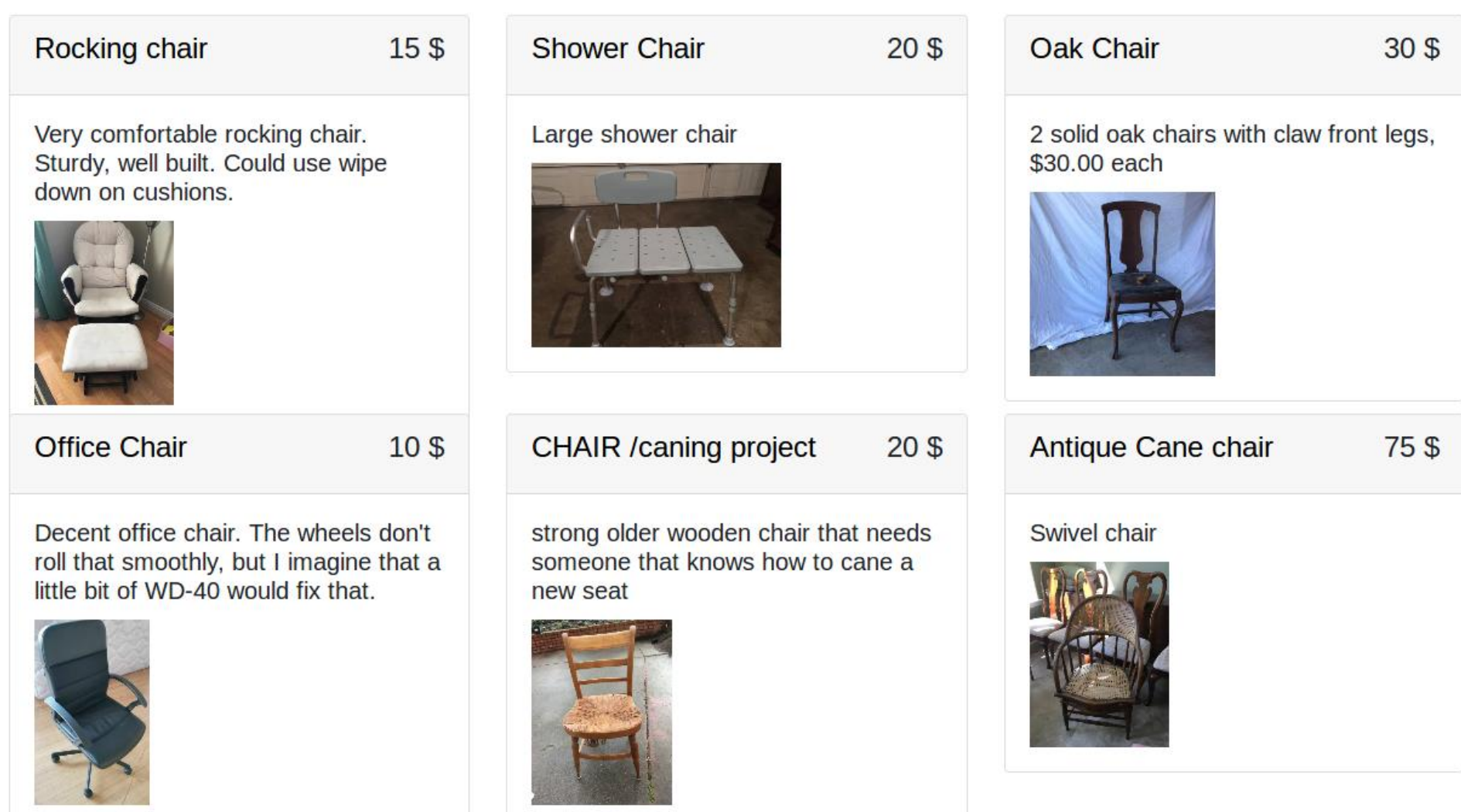

Figure 6 Results of Text Retrieval

Spell Check

We use the spell check and image retrieval to get the rough search result. Then users can get the exact product by select price interval and facets of product.
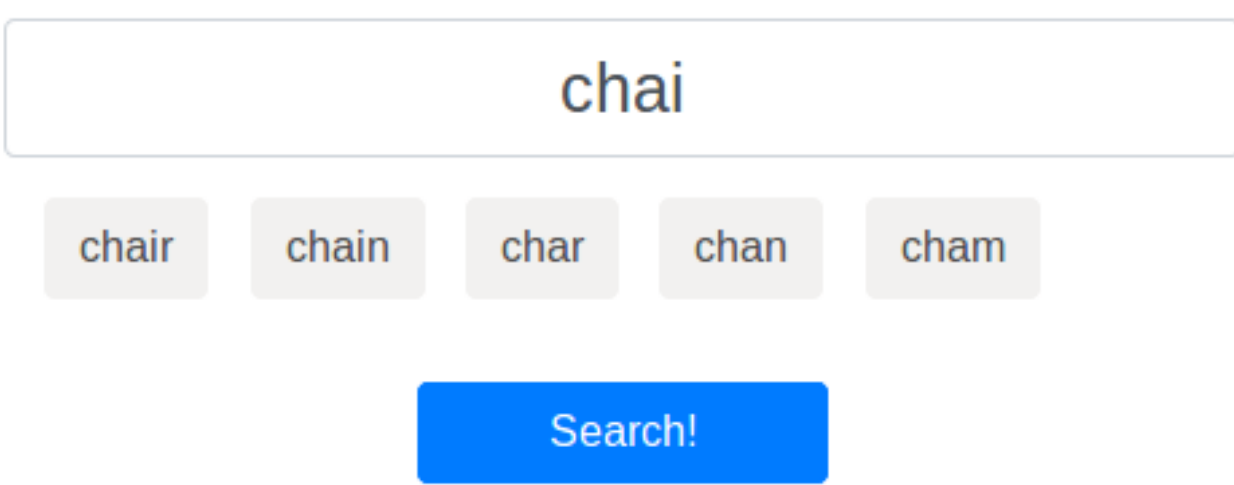We sort the tags according to the popularity of the tags among search result.

Figure 7 Spell Check

Image Retrieval

There are some demands on image retrieval, especially two cases.
1. The image information can help the original text retrieval system to re-rank the searched result.
2. The user may only have the picture of the second hand product and don't know the exact name or description in text language (for example, the website with image retrieval function can help non-Swedish people to search what they want through image without the need of enter Swedish text).
After testing and discussion, we choose the average pooling feature vector in ResNet18 (pretrained with ImageNet) in our system.
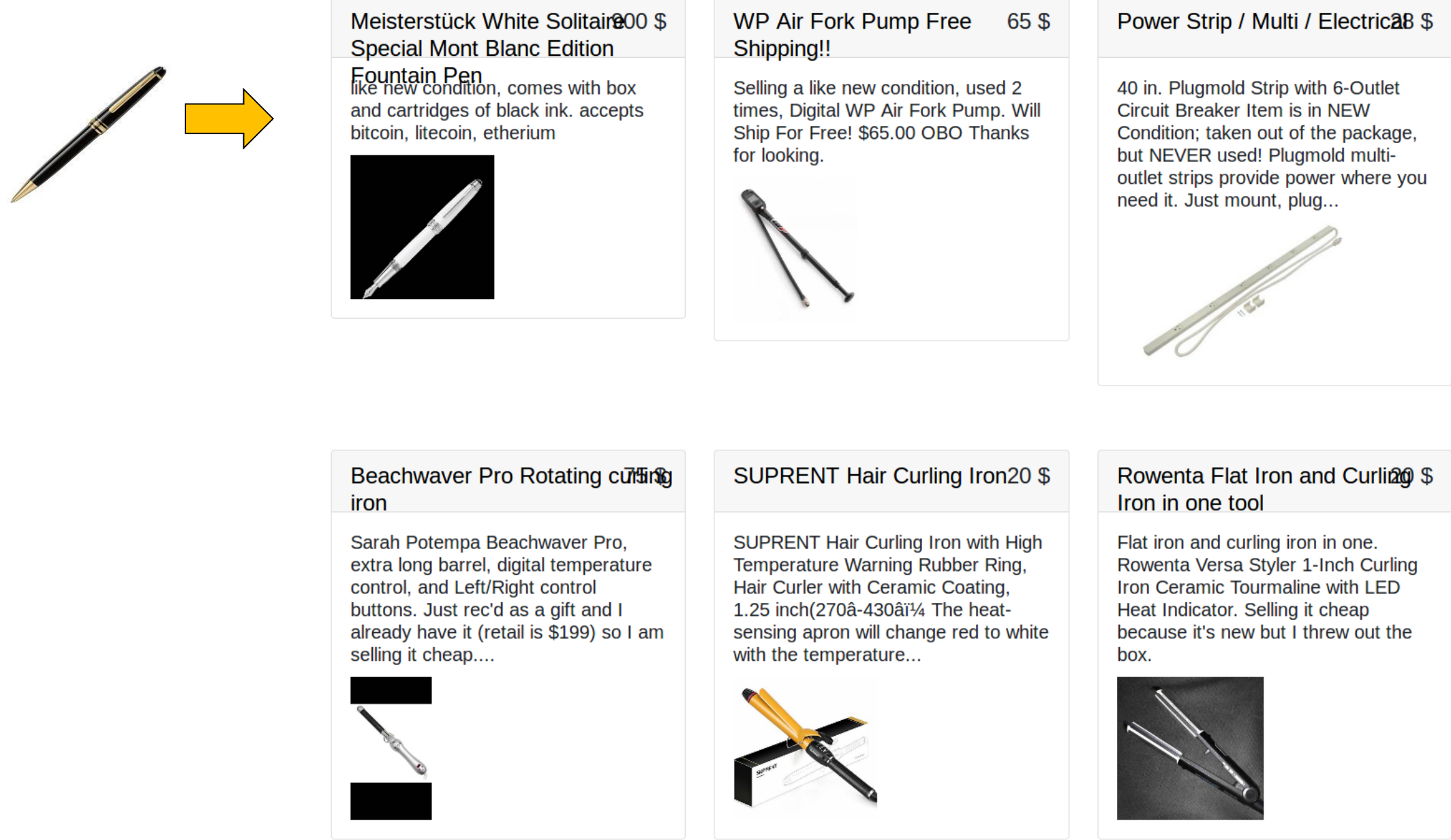

Figure 8 Image Retrieval

As shown in **Figure 8 ,** if a picture of pen is input, many products of pen will be searched.

Recommend System

The website will smartly recommend some products based on user's browsed history. The backend silently scans and collects the user's data (Specifically, we scan the viewable time of different products and record the percentage of occupied time in different classes, also with high frequency token in each of them).

Conclusions

In conclusion, we made an intelligent search engine on the second-hand market with several novel functions.
We use the spell check and image retrieval to get the rough search result. Then users can get the exact product they want by select price interval and use auxiliary facets of product. Besides, smart recommendation system is user friendly.
All in all, the intelligent search engine provide users an excellent shopping experience without tedious search.