

# Online Job Search: Study of Users' Search Behavior using Search Engine Query Logs

The 41st International ACM SIGIR Conference on Research and Development in Information Retrieval  
Ann Arbor Michigan, U.S.A | July 8-12, 2018

	Behrooz Mansouri	M.Sadegh Zahedi	Mojgan Farhoodi		Ricardo Campos
	WebAzma lab, Information Technology Faculty, Iran Telecommunication Research Center, Tehran, Iran				Polytechnic Institute of Tomar, INESC TEC – LIAAD, Portugal
	{b.mansouri, s.zahedi, farhoodi}@itrc.ac.ir				ricardo.campos@ipt.pt

## Introduction

Over the last few years, an increasing number of users and enterprises on the internet has generated a global marketplace for both employers and job seekers. Despite the fact that online job search is now more preferable than traditional methods - leading to better matches between the job seekers and the employer's intents - there is still little insight into how online job searches are different from general web searches. In this paper, we explore the different characteristics of online job search and their differences with general searches, by leveraging search engine query logs. Our experimental results show that job searches have specific attributes which can be used by search engines to increase the quality of the search results.

## Research questions

1. How often are search engines used for searching for a job?
2. How is users' effort different in searches related to jobs?
3. Which websites are mostly clicked regarding job searches?
4. How users formulate their queries in job searches? How the length of these queries are different from general ones? How often temporal expressions and named entities such as organization or location are used in job searches?
5. May search engines help users find their desired job?

## Experimental setting

- Using two-year query logs of a Persian search engine, named Parsijoo. ([www.parsijoo.ir](http://www.parsijoo.ir))
- Using keyword-based method to extract job search related queries.
- Studying 512,483 job search records and randomly selected the same amount of records as general searches for comparison.

## Literature cited

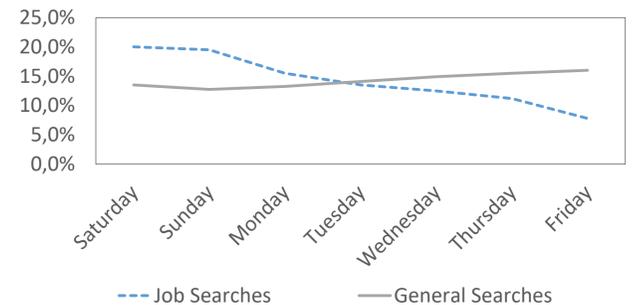
- Baker, S. R., & Fradkin, A. (2014). The Impact of Unemployment Insurance on Job Search: Evidence from Google Search Data. *Review of Economics and Statistics*, (0).
- Jansen, B. J., Jansen, K. J., & Spink, A. (2005). Using the web to look for work: Implications for online job seeking and recruiting. *Internet research*, 15(1), 49-66.
- Kuhn, P., & Mansour, H. (2014). Is Internet job search still ineffective?. *The Economic Journal*, 124(581), 1213-1233.
- Mansouri, B., Zahedi, M. S., Campos,

- R., Farhoodi, M., & Yari, A. (2018, April). Understanding the use of Temporal Expressions on Persian Web Search. In *Companion of the The Web Conference 2018 on The Web Conference 2018* (pp. 1743-1748). International World Wide Web Conferences Steering Committee.
- Spina, D., Maistro, M., Ren, Y., Sadeghi, S., Wong, W., Baldwin, T., Cavedon, L., Moffat, A., Sanderson, M., Scholer, F. and Zobel, J. (2017) Understanding user behavior in job and talent search: an initial investigation. In *Proceedings of the 2017 SIGIR Workshop on eCommerce (eCom 2017)*. CEUR-WS. org.

## Experimental results

### Frequency of Job Search

- Queries issued by users are related to the job seeking task, which account for 1.89% of the total queries
- Job searches are mostly done within the first days of the week (in Persian calendar, Thursday and Friday are weekend days). Frequency of general searches which show a reverse trend as more queries are issued during the weekends as opposed to the beginning of the week.
- This can be leveraged by content providers and companies who may plan to publish their hiring advertisements during the first days of the week
- The distribution of Job related queries by cities was also different, mostly done in industrial cities. One such information can be used by search engines to better target their ads for a few cities, where job search is predominantly carried out.



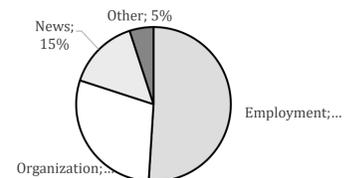
The distribution of job search related and other type of queries during week days.

### Users' Effort

- By comparing the number of queries per search session, the number of clicks on search engine result pages (SERPs) and the search session duration in job against normal searches.
  - On average, 1.62 general Persian web search queries are issued by a user, while 2.45 were submitted in search sessions related to job search, suggesting that users try to reformulate their query to better find the desired information.
  - For job searches the average number of clicks per search session sums up to 3.69 clicks, while for general searches this figure is reduced to only 1.30 clicks, which may also be related to the fact that some of this web pages are of navigational nature
  - Our analysis indicates that, the average search duration for job searches is 15.98 minutes, while for general search is only 3.04 minutes.
- Overall, the users' effort is considerable higher in job searches when compared to general searches, as more queries are issued, more result pages are viewed and more time is spent by users to seek their desired job.

### Clicked Pages

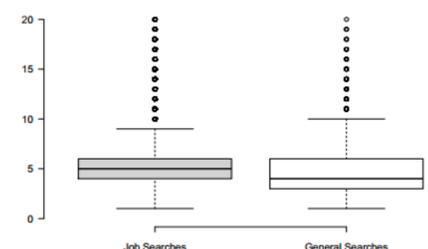
- To do so, we considered the top 300 clicked URLs in job searches, which account for 71% of the total clicked pages in job searches. Next, we manually categorize them into one the four types below:
  - Employment: vertical web search engines web pages belonging to job agents such as "www.bazarekar.ir".
  - News: news websites such as "www.yjc.ir".
  - Organization: webpages belonging to specific organization such as "www.police.ir".
  - Other: any webpages that cannot be put into one of the previous types.
- Overall, from this obtained data, it can be concluded that the majority of job seekers, prefer to be forwarded to specialized websites as opposed to general web search engines which lack in providing job-dedicated search options.



The distribution of click web pages in job searches.

### Query Formulation

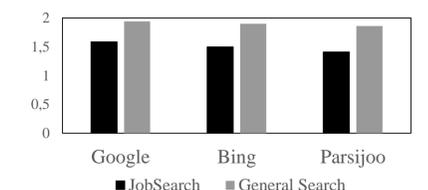
- Considering query length, the use of temporal expressions and named entities such as location and organization in job searches.
  - The most frequent queries related to the job search task have a length between 4 and 6 terms, with 5.3 terms per query on average, which is 2.1 terms longer when compared to general searches.
  - In job search queries, 35% of queries contain temporal expressions. This contrasts with the results of our recent study on the use of temporal expressions in web searches where we were able to show that a minority of only 1.89% of the queries contain temporal expressions.
  - Our analysis shows that in 22% of all the job searches, users have mentioned the place where they are seeking for a job. Also, a minority of only 5% of the queries includes organizations mentioned by the users.



Boxplot of query length distribution for job and general searches.

### Users' Satisfaction

- To do users' satisfaction, we asked three editors to submit 1000 random job queries to 3 different search engines (namely Google, Bing and Parsijoo) and check the top-5 result pages to verify whether or not their information need is satisfied.
- They were asked to score search engines by one of the three scores: 2, 1 or 0, where 2 means that the search engine was able to find at least one document that satisfies all of the constraints in the query, 1 means constraints in the query were partially satisfied and 0 indicates that no constraints in the user query were satisfied.
- Regardless the search engine, results were noticeably more satisfiable for general search then for job search ones. This may raise the question of whether general purpose search engines such as Google, Bing or Parsijoo can provide good job-search results.



The distribution of click web pages in job searches.

## Conclusions

Despite the fact that online job search has become common mean of job seeking process, users' job search behavior was not fairly studied. In this paper, we explored online job searchers' behavior and compared job and general searches. Our analysis showed that, job seekers formulated their query differently when compared to general searches and target fresh data in their searches. By investigating three different general-purpose search engines, our finding shows that job search result are not yet as satisfactory as general searches. As for future work, we plan to use our experiment findings and study how search engines can provide better job searches facilities and increase users' satisfaction.

## Further information

- [www.ccc.ipt.pt/~ricardo/](http://www.ccc.ipt.pt/~ricardo/)
- <http://dbrg.ut.ac.ir/>

Download this Poster