**Investigating the Learning Process in Job Search: A Longitudinal Study**

Jiaxin Mao¹, Damiano Spina², Sargol Sadeghi³, Falk Scholer², Mark Sanderson²

maojiaxin@gmail.com, ssadeghi@seek.com.au, {damiano.spina, falk.scholer, mark.sanderson}@rmit.edu.au

¹Tsinghua University, China, ²RMIT University, Australia, ³SEEK Ltd., Australia

---

**Background: Search as Learning**

- Users learn new knowledge and search strategies during search
  - Exploratory search
  - Completing complex search tasks
- Understanding the learning process in search tasks can enable better support for complex search tasks
- The learning process in search has been studied in IIR
  - Kuhlthau’s Information Search Process (ISP) model (Kuhlthau, 1993)
  - Vakkari’s 3-stage model for the learning process in search (Vakkari, 2001)(Vakkari, 2016)

**Methodology**

- Restructuring
  - Conceptual changes
- Tuning
  - The scope of concepts
- Assimilation
  - Instantiating conceptual structure

---

**Characterizing Job Search Tasks**

- The statistics of job search tasks
  - Job search is complex
  - Assumption: it is unlikely that a job seeker will be involved in multiple job search tasks at the same time
  - The process lasts for days or weeks
  - The collection of available jobs may change during the process
  - Job seekers tend to learn over time: available jobs and how to search for a job
  - Investigating the role of how the search behavior changes during the job search process is essential for building a better job search engine

**Research Questions**

- **RQ1**: How is job seekers’ search behavior characterized?
- **RQ2**: How does the behavior change over time?
- **RQ3**: Does information consumption (result clicks) and response behavior (application lodging) change over time?

**Methodology**

- Data collection
  - ~125,000 queries from thousands of randomly sampled users of SEEK
  - No personally identifiable information was available or used in experiments
  - Contains:
    - Queries
    - # clicks, click-through rate, application rate
    - Filters on job classification, work type, job location, salary range, and posting time
- Partition the query log into job search tasks
  - Assumption: it is unlikely that a job seeker will be involved in multiple job search tasks at the same time
  - Used a 14-day gap in logged actions as boundary of distinct search tasks
- Investigate the changes of search behavior over time
  - Divide the process of each search task into three stages of equal time
  - Compare users’ querying, click, and application behavior in three stages
  - Conduct one-way ANOVA to test whether the behavioral measures differ between stages

---

**Changes in User Behavior over Time**

- The statistics of search behavior in three stages (n = 5, 159 × 3 = 15, 477)

**Discussion**

- Vakkari’s model predicts that at the last assimilation stage, users will:
  - Have a clear usefulness criteria
  - Have a lower click rate
  - and a higher use/selection ratio (i.e. a higher application rate)

**Conclusions**

- **RQ1**: How is job seekers’ search behavior characterized?
- **RQ2**: How does the behavior change over time?
- **RQ3**: Does information consumption (result clicks) and response behavior (application lodging) change over time?

---

Jiaxin Mao, Damiano Spina, Sargol Sadeghi, Falk Scholer, Mark Sanderson

maojiaxin@gmail.com, ssadeghi@seek.com.au, {damiano.spina, falk.scholer, mark.sanderson}@rmit.edu.au