Evolving Search User Interfaces

euroHCIR Workshop 2013

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Motivation

- When designing search user interfaces (SUIs), there is a need to target specific user groups
  - differ in information needs
  - differ in search goals
  - differ in cognitive abilities
  - ...
Motivation

Challenge:
- Especially young and elderly users undergo fast changes in
  - cognitive,
  - fine motor,
  - and other abilities
- Design requirements change rapidly as well and a flexible modification of SUI is needed

Solution:
- Evolving search user interface (ESUI)
  - adapts to individual user’s characteristics
  - allows for changes in properties of UI elements
  - influences the UI elements and their positioning
ESUI Vision

Figure 1: Model of an ESUI.
Mapping Function

\[ U: \begin{pmatrix} u_1 \\ u_2 \\ \vdots \\ u_n \end{pmatrix} \]

\[ I: \begin{pmatrix} i_1 \\ i_2 \\ \vdots \\ i_m \end{pmatrix} \]

\[ F: U \rightarrow I \]

cognitive abilities
information processing rates
fine motor skills
reading skills
perception
domain knowledge
writing skills
emotional maturity

search input
menu type
metaphor
menu categories
menu structure
font
results visualization
number of results
surrogate structure
result page view

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Design Ideas

six-year-old Jenny
- limited reading abilities
- limited writing abilities
- 5,000 words active vocabulary
- cannot understand abstract categories
- is not able to process much information
- not fully developed fine motor skills

nine-year-old Jenny
- can read short stories
- few spelling errors
- 10,000 words active vocabulary
- cannot understand abstract categories
- is able to process more information
- difficulties using a keyboard
- easily frustrated

fourteen-year-old Jenny
- good reading abilities
- good writing abilities
- 20,000 words active vocabulary
- can understand abstract categories
- is able to process even more information
- good fine motor skills
User Study

Hypothesis:
- Users from different age groups would prefer to use different UI elements and different general UI properties

Design:
- Users from different age groups
- Preferences for results visualization
  - vertical list of snippets
  - tiles
  - coverflow
User Study

Procedure:

1. Pre-interview
2. Search with “bad” settings
3. SUI adaptation
4. Task solution
5. Post-interview

First results:

- 44 subjects participated:
  - 27 children (8.9 on average)
  - 17 adults (29.2 on average)

Figure 2: Study results: what type of visualization do children and adults prefer.
Open Questions

- Mapping function
  - user studies about users’ search behavior and SUI design preferences

- Adaptive or adaptable SUI
  - how to adapt
  - a SUI in a way users would accept the changes

- Detection of user abilities
  - age of a registered and logged-in user
  - psychological tests covered in form of games
  - log files, in specific, issued queries (their topic and specific spelling errors) and accessed documents
Thank you for your attention!