CSA402

Lecture 13

Solutions provided by Adaptive Hypertext Systems
Problems addressed

• Lost in HyperSpace
• Cognitive overload
• Complexity of the search space
• Search-browsing
• Static hypertext structure

Generic solutions

• Adaptive Presentation
• Adaptive Navigation
Lost in HyperSpace

- Mark-up nodes to include link to landmark which user knows about

- Show relationship between landmark node and current node

- Reduce cognitive load on user
Cognitive overload

- Move (some) linking functions into AHS system by, e.g., providing "See Also" links
- Automatic/dynamic linking
- Reduce number of outlinks by removing links to non-relevant nodes
- Link recommendation services
Complexity of the search space

- Removing links reduces the size of the search space
- Recommending links assists the user in deciding which links are likely to lead to relevant information
- Automatically modifying content enables readers to understand concepts at their level of understanding
- Learn from user access paths to reorganise hyperspace
- Learn to associate user terminology with document content
Search-browsing

- Dynamic linking as a result of where user is combined with any stated query terms

- Recommend links (paths) to relevant documents
Static hypertext structure

- Users can modify content, and/or system can learn from users

- What change(s) in particular is required to hypertext systems? IR systems?

- Dynamic hypertext systems
What can be adapted?

- A hypertext is a collection of nodes that are connected by links
- So what can be adapted?

The node content and user interface - *adaptive presentation*

The node organisation and hyperspace representations (e.g., index, map, overview) - *adaptive navigation*
Adaptation Technologies

Adaptive Presentation

• Anything to do with adapting *how* the presented material is displayed to users

Examples

• Adapting the UI (more to do with adaptive user interfaces than adaptive hypertext *per se*)

• Modify data presentation so that it is presented in user's preferred choice (e.g., charts)

• Automatically expand/collapse glossary items according to user's level of expertise

• Provide "trails" through hyperspace according to user's level of expertise

• Can be fairly complex - if user does not know concept A, then unlikely to know concept B, so concept B should also be automatically expanded
Adaptive Presentation (contd.)

- Adaptive presentation can be useful in any adaptive hypertext system, but mostly used in Intelligent Tutoring Systems
Adaptive Navigation

• Focused around implicit link types in hypertext systems

  Identify as many implicit link types as possible

• Direct Guidance

  Mainly through "Next" buttons!

  Can include link/path recommendation

  What are the pre-requisites?

• Adaptive Sorting of Links

  Ordering links according to some ranking scheme

  On what basis?

  On which of the implicit link types can this be provided?
Adaptive Navigation (contd.)

• Adaptive hiding of links

Hide links which would lead to non-relevant information

What are the pre-requisites? In ITS systems? In generic AHSs?

Identify implicit link types which support adaptive hiding

• Adaptive annotation of links

Mark-up anchor text/link description to explain the information at the destination of the link

Description must be adaptive!
Components of an AHS system

- Hypertext system
- User Model
- One or more of:
  - Domain model
  - IR system
  - Adaptation Rules
  - Link base