Adaptive Navigation Methods and Techniques: The Basics

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Adaptive navigation support is a specific group of technologies that support user navigation in hyperspace, by adapting to the goals, preferences and knowledge of the individual user.

Motivation

• Help the user achieve their goals faster
• Reduce navigation overhead
• Increase user’s satisfaction with the system
Aims

- Local Guidance
  - Next best
- Global Guidance
  - Ultimate goal

Guidance

- Local Orientation
  - Local area
- Global Orientation
  - Whole Hyperspace
Adaptation Techniques

A Basic Hypertext
Adaptation Techniques
Motivation?

• Novice users with poor domain knowledge can struggle in making navigation choices

• Fear of getting ‘Lost in Hyperspace’

Direct Guidance

Direct guidance is the simplest technology for adaptive navigation support. Direct guidance suggests the "next best" node (or sometimes, several alternative nodes) for the user to visit according to the user's goals, knowledge, or/and other parameters that have been represented in the user model.

Direct Guidance

- Direct guidance can be presented to the user in two ways
  - Emphasize a link that is already on the page, e.g. Personal WebWatcher
  - Create a dynamic “Next” link which is connected to the next best page

Issues with Direct Guidance

• Does not necessarily simplify the navigation

• What about scrutability?
Adaptive Link Sorting / Link Ordering

The idea of an adaptive sorting or ordering technology is to prioritize all the links of a particular page according to the user model and some user-valuable criteria: the closer to the top, the more relevant the link is.

User control in Link Ordering

• Links may be manually reordered by dragging

• Manual link reordering is considered by the system as a means of relevance feedback and is used to update the user model
  • Confidence metric needed as this implies the user ‘understands’ the links
Issues with Link Ordering

- Unstable link structure
  - Not well suited to Indexes or Table of Contents
  - May make it difficult for the user to understand the scope of the content linked to
  - Appropriate where all or some of the pages have an unstable set of links like adaptive news systems
Link Hiding

As an adaptive hypermedia system, AHA! performs the typical operations described in [Bra96]: adaptive presentation and adaptive navigation support. We describe how the different methods and techniques from [Bra96] and [Bra01] can be realized in AHA!, and even extended. We specifically describe the presentation style adaptation, the conditional inclusion of objects and the use of adaptive link destinations. We also use these techniques in this adaptive paper.

Source: Paul De Bra, Ad Aerts, Bart Berden, Barend De Lange, Brendan Rousseau, Tomi Santic, David Smits, Natalia Stash, AHA! The adaptive hypermedia architecture, Proceedings of the fourteenth ACM conference on Hypertext and hypermedia, 81-84
Link Hiding

• Restricts the navigation space by hiding, removing or disabling links to pages deemed irrelevant

• Reduces cognitive overload by protecting users from the complexity of the whole hyperspace

• Limited by its ‘binary’ approach…
  • Relevant or not relevant: link shown or not
Link Annotation

• Overcomes the ‘binary’ approach in Link Hiding
• Augment links with some visual cues to let the user know
  • about the relevance of a page
  • more about the page behind the annotated link

Link Annotation

• Iconographic approaches common
  • ‘Traffic light’ annotation popular
    • Red: unsuitable; Amber: may be suitable; Green: suitable
  • Icons can indicate many things, but care needs to be given to not using too many
Link Generation

- Automatically generate links at runtime based on semantic similarity of terms in text and other sources
- Enables web-scale adaptation as design time knowledge of linked-to resource not needed
- May be combined with Link Annotation
Issues with Link Generation

• Growing hyperspace
  • Orientation may be an issue
What we covered today

Adaptive Applications

Adaptation Techniques

Domain / Context

Content / Services

Adaptive User Interfaces

Adaptive Service Selection

Adaptive Navigation

Adaptive Presentation

Freedom

Regulation

Scrutability

User Control

User Modelling

What

Maintenance

How

Vocabulary?

Format?

Stereotypes/Features/Overlay

Implicit/Explicit/Blended

Knowledge/Interests/Goals/Background/Traits

Completeness?

Metacognition

CS7155 - Adaptive Navigation Methods and Techniques: The Basics
Reading for next the lecture

  • Just read pages 1 to 10.
Questions?

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