Content Adaptation Methods and Techniques: The Basics

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Definition of Adaptive Hypermedia

All hypertext and hypermedia systems which reflect some features of the user in the user model and apply this model to adapt various visible aspects of the system to the user.

What is an Adaptive Hypermedia Application?
Figure 1. Classic loop "user modeling - adaptation" in adaptive systems

- **Adaptation techniques** refers to methods of providing adaptation in existing AH systems.

- **Adaptation methods** are defined as generalizations of existing adaptation techniques.
Basic Forms of Adaptation
Figure 2. Possible classifications for AH methods and techniques. An arrow stands for 1-to-N relationship.

A Basic Hypertext
Adaptation techniques

Methods of Content/Text Adaptation

• Typically trying to realise…  
  • Additional explanations  
  • Prerequisite explanations  
  • Comparative explanations  
  • Explanation variants  
  • Sorting (of fragments by the relevance)

• Why do we do these?  
  • Mitigate cognitive overload  
  • Ease user’s ability to assimilate new information
Cognitive Load Theory (1)

• Contents of long term memory are "sophisticated structures that permit us to perceive, think, and solve problems," rather than a group of rote learned facts
  • These structures are known as schemas
• The difference between an expert and a novice is that a novice hasn't acquired the schemas of an expert. Learning requires a change in the schematic structures of long term memory and is demonstrated by performance that progresses from clumsy, error-prone, slow and difficult to smooth and effortless.

Cognitive Load Theory (2)

Cognitive load theory is concerned with techniques for reducing working memory load in order to facilitate the changes in long term memory associated with schema acquisition.

Adaptation techniques

Adaptive multimedia presentation
Adaptive text presentation
Adaptation of modality
Canned text adaptation
Inserting/removing fragments
Altering fragments
Stretchtext
Sorting fragments
Dimming fragments

Adaptive presentation

Adaptive hypermedia technologies

Direct guidance
Adaptive link sorting
Adaptive link hiding
Hiding
Disabling
Removal

Adaptive navigation support

Adaptive link annotation

Map adaptation
Adaptive link generation
Techniques of Content Adaptation (1)

- **Conditional text, aka inserting/removing fragments**
  - All possible information is divided into several chunks of texts, which is conditionally (based on the user model) displayed
  - Benefit: content does not take up screen real estate
  - Weakness: user is not aware of what they are missing
Techniques of Content Adaptation (2)

- **Dimming Fragments**: similar to inserting/removing fragments, but the opacity is adjusted instead
  - Benefit: user is still aware that there is content
  - Weakness: still takes up screen real estate
Techniques of Content Adaptation (3)

Stretchtext

• Replace the activated hotword extending the text of the current page
• Collapse the non-relevant stretchtext extension, uncollapse the relevant ones
• Weakness: user has to uncollapse hotwords to see what is there.
Techniques of Content Adaptation (4)

• **Page variants techniques**: two or more variants of the same page with different presentations of the same content

• **Fragment variants**: as above, but at the fragment level. Usually variants of explanations for each concept

  • Benefit: optimal use of screen real estate
  • Weakness: user does not have the ability to choose variant
What’s missing?

• Content has been dealt with as very much textual

• What about multimedia content?
  • ... and multi-modality?

• What about interactive services?

• What about the user interface?
What we covered today
Reading for next the lecture

Questions?

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