Personalization: Adaptive Approaches

Sylvie Foss
The magical world of Windows XP

Source: http://www.guidebookgallery.org/screenshots/winxppro
It must have been a good idea
It’s actually really useful
More programs should have it
Unlike this useless feature

Source: my computer
Who needs adaptive interfaces?

- People have different abilities
  - Computer expertise
  - Drawing skill
  - Folks with fat fingers

- Background knowledge
  - Newcomers vs. experts

- Disabilities and accessibility issues
Sometimes, help would be nice
Let’s learn how to use FL Studio

- I’ve just bought a new music creation program
- Can you help me get started?
  - I’ve heard good things about “Sytrus”
Who should adapt?

• Either the user learns
  ▫ Tutorials
  ▫ Inline help
  ▫ Trial-and-error

• Or the system learns
  ▫ Adjust UI to match user patterns
  ▫ Help user as needed
Make the system adapt!

- Who wants to learn new software anyhow?
  - Took me ages to learn FL Studio, and it was trial-and-error
- But it can be pretty annoying
  - Visual popout from today’s paper
  - Moving instead of copying
  - Even research with my team
- So there are trade-offs
How to not be annoying

• People like to have a choice
  ▫ Copying instead of moving
  ▫ Toggle for my team’s UI

• Stability

• Satisfaction over speed
  ▫ Speed benefits only in unrealistic tasks
More on stability

• Gajos et al. (2008) thought in terms of predictability and accuracy
  ▫ “Predictable if it follows a strategy users can easily model in their heads”
  ▫ Accuracy is how long UI components stay in the adaptive area

• Simple and functional vs. more accurate but confusing learned approach
  ▫ Users actually liked accuracy over predictability!
Incremental interfaces

• Add functionality as you learn

• What and when?
  ▫ *What* functionality to add
  ▫ *When* to add it
InterBook

- Web-based interface by Brusilovsky et al. (1996)
- System for reading and writing textbooks
- Interface is way too complicated
  - Separate windows for navigation, support, etc.
  - Some features go ignored
A pretty (complicated) UI

4.2.1 Text window

The lower left subwindow of the Textbook window is the Text window. This window shows a particular section of the textbook which is called current section. It can be a terminal section or a high-level section (the most high-level section is the Interbook itself). For a terminal section the Text window shows the title of the section and the section itself. For a high-level section the Text window shows the title, the section prefix (if existing) and the full table of contents for the section (i.e., list of hierarchically structured titles of its subsections down to terminal level). All names of the subsections are clickable links.

Continue ...
User-as-student metaphor

- Adaptive electronic textbooks act as tutors
  - Keep track of student knowledge
  - Suggest more as they fill the prerequisites

- Think of the user as a student learning how to use the interface
  - Now we can solve our problem with adaptive tutoring
  - UI features are concepts to learn
Adapting for accessibility

• Accessible touch screens
  ▫ Users with reduced motor control
  ▫ Eyesight considerations

• How to adapt for these people?
  ▫ Depends on environment
  ▫ User-specific capabilities

• Certain needs at certain times
The Shared User Model

- PhD work of Kyle Montague (2012)

- Log user and environment data
  - Capture user interactions
  - Sensors to observe light, noise, etc.

- Adjust the UI accordingly
  - Adjust required touch duration, thresholds for movement, target sizes, brightness, etc.
MyUI project

- García et al. (2012) also developed a system for special needs adaptation
  - Gathers data on usage
  - Combines modular interaction components to form suitable UI

- “Adaptation engine” determines what to do
  - For vision problems, make the font bigger
  - For very poor vision, read the text aloud
Looking toward the future

- Further evaluation in realistic scenarios
  - Existing systems sound promising, long-term

- Much work still required
  - Still difficult to find balance between helpful and irritating
  - Machine learning

- Adapt to adaptation; it is worth it
  - Enormous design overhead
Discussion

• What would happen if your house adapted to your needs?
  ▫ Ruin aesthetics if the front door moves closer to the car?
  ▫ Could you keep track of your belongings?
Discussion

• What are some adaptive interfaces you’ve used?
  ▫ Which UIs do you wish were adaptive?
Discussion

• What obstacles are preventing the adaptation of adaptation?
  ▫ Which obstacle is the biggest?
Discussion

• Is there value in subsets of interfaces?
  ▫ eg: Different UI for students, children, elderly, etc. and each is also adaptive
References


