

CS5540 HCI

This Ain't Rocket Science...

Rich Riesenfeld
27 November 2002

2 Click Rule

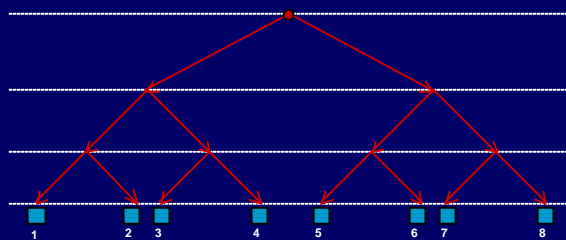
- Any item should be accessible in “2 clicks”
- Problems
 - If there are many items, then the menu list gets VERY long!
 - If the tree is more structured, some items will get buried deeper
 - Can us dynamic structure (a la MS)

Fall 2002

CS5540

2

2 Click Rule

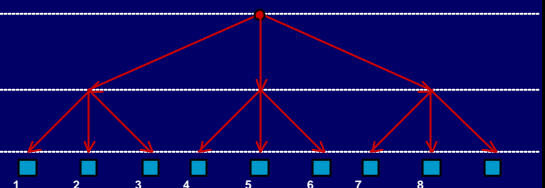


Fall 2002

CS5540

3

2 Click Rule



Fall 2002

CS5540

4

Modes

- *Modes* – the same action means some different depending on the “mode”
 - Many examples abound
- *Modes* are likely to be confusing

Fall 2002

CS5540

5

Modes

- Digital alarm clock: Time v Alarm
- Car stereo: Treble-Bass, Lt-Rt, Fr-Back
- Emacs
- Various finite state machines
- Computers
- Automobile controls
- Remote for TV-CD-VCR

Fall 2002

CS5540

6

Modes

- What *mode* am I in?
 - Should always be able to answer
- Maintain analogies (parallelisms)
 - Similar actions produce analogous functions in various modes
 - Examples ??
 - This is a kind of consistency, really

Fall 2002

CS5540

7

Smart (non-dumb!) Interfaces

- Who is the user?
 - Does the interface behave differently depending on the user?
 - Is it customizable?
 - Does it remember things?
- Does it comes up in unexpected modes?

Fall 2002

CS5540

8

Smart (non-dumb!) Interfaces

- Recall context from previous sessions?
 - Restore windows and pgms?
 - Allow easy return to “state” ?
- Tactfully, alert against and resist nonsense inputs
 - Not allowed to do that ... *maybe you want to do this...*

Fall 2002

CS5540

9

Smart (non-dumb!) Interfaces

- Does it prompt? Anticipate?
- Does it annoy, get in the way, give unhelpful, distracting msg's? (paperclip)
- The user's efforts should be *respected* !
 - Offer typical choices?
 - Do a GOOD MS Paperclip!

Fall 2002

CS5540

10

Smart (non-dumb!) Interfaces

- Does it sense and react to the environment?
 - Dim lights when light is low?
 - “Talk” louder when environment is noisy.
 - Fast and slow digital counters, etc.
 - Generate resistance to mistakes
 - Avoiding multiple clicks... (my office phone)
 - Stuff like that...

Fall 2002

CS5540

11

Smart (non-dumb!) Interfaces

- Be responsive to inputs!
 - Departure date is AFTER arrv date, so advance it on input
 - Present a good choice for first guess. Today's date, not 1 Jan, etc..
 - Other examples??

Fall 2002

CS5540

12

Smart (non-dumb!) Interfaces

- Good defaults
 - Nonsmoking hotel room
 - Aisle seat, when available
 - Table apart from noisy group
- Profiles, histories, data gathering
- “Having your usual, madam?”
 - Quick select, speed dialing,
 - Don't require repeated input of same info

Fall 2002

CS5540

13

Smart (non-dumb!) Interfaces

- Assist with available “knowledge”
 - Spell checker, style checker
 - Color choices
 - Formats, templates, etc
 - Style critique
- Don't be lazy; pamper the user.

Fall 2002

CS5540

14

Smart (non-dumb!) Interfaces

- Assist with “knowledge”
 - Pharmacy: patient drug interactions
 - Automobile guides: Neverlost
 - “Hey, my map says that this is a *one-way*.
Achtung!” – Why doesn't it do this?
 - Cannot lock key in ignition, etc.
 - Cannot leave car in *Drive*
- Others?

Fall 2002

CS5540

15

Smart (non-dumb!) Interfaces

- Narrow choices: Car Radio, eg
 - Scan for next
 - *Jazz, Country, News, Sports, Spanish*
 - Restaurants by *locale, type, cost*, etc
 - Movies by genre, and the like
 - *Action, Drama, Documentary, Foreign*, etc

Fall 2002

CS5540

16

Smart (non-dumb!) Interfaces

- UI should TRY to figure out problem, and try to *solve* it
 - Too easy to just complain, then
 - Core dump
 - Bail
 - Force user to start process over

Fall 2002

CS5540

17

Smart (non-dumb!) Interfaces

- UI should TRY to figure out problem, and try to solve it
 - It may know the problem, and be able to fix it, or guide the user to easily fix it
 - Matching parens, eg
 - It looks as though... May I fix this?
 - Use "back pointers" to maintain correctness. Filters and mailboxes in Eudora. Hey!

Fall 2002

CS5540

18

Smart (non-dumb!) Interfaces

- Guide user through tasks
 - What next?
 - Where am I in the grand scheme?
 - Does questionnaire tell you how much left?
 - Should I quickly finish, or break here?
 - Offer good defaults
 - Give stats on choices
 - 90% of users do this ->

Fall 2002

CS5540

19

Smart (non-dumb!) Interfaces

- Example – 4 wheel steering
 - Slow behavior (radical turns)
 - Fast behavior (gentle turns)
 - Forward v. Backward ??
- Automatic trans, another example
 - Using context for smart, autonomous behavior
- Anti-skid, anti-lock, etc.
 - Takes control, and does what is needed

Fall 2002

CS5540

20

4 wheel steering

- 2-wheel steering



- 4-wheel
 - Low speed



- 4-wheel
 - High speed



Fall 2002

CS5540

21

Smart (non-dumb!) Interfaces

- Security
 - When to help with password?
 - Providing info to wrong user?
- How prudent, how circumspect is appropriate?
 - Video game, medical records, replace passport, info on grades, etc.

Fall 2002

CS5540

22

Smart (non-dumb!) Interfaces

- UI should act as an assistant, or even an *associate*
 - Know the user: I like coffee in the morning
 - Watch activities, learn, remember
 - Help out: special terms, abbrev's, etc
 - Guard against mistakes: *force feed-back*
 - Offer comfortable advice and assistance
 - "Think along. Know the art of helping!"

Fall 2002

CS5540

23

Smart (non-dumb!) Interfaces

- UI should act as an assistant
 - Think along, understand what is going on
 - Be friendly, not demeaning
 - Communicate in effective, straightforward terms, not "geekspeak"
 - Unobtrusively refer to explanations (clickable, etc) for technical items, background

Fall 2002

CS5540

24

Smart (non-dumb!) Interfaces

- Beaucoup sensors
 - Temp, pressure, cameras, gaze, etc., etc.,
- Beaucoup processors
 - Ids, DBs, agents, ...
- Continuous, immersive involvement

Fall 2002

CS5540

25

Smart (non-dumb!) Interfaces

- Speech input
 - Talk to UI
 - UI talks to User
 - Shneiderman doubts its potential, however
- Gestures

Fall 2002

CS5540

26

Gestures Studies

Following *Gesture* material from:

**Hand Centered Studies of
Human Movement Project,
School of Kinesiology, Simon
Fraser University, February 1996**

Fall 2002

CS5540

27

Gestures-1

- Praying (two flat hands up together)
- Begging (flat hand)
- Expressing anger (raising a fist)
- Derogation (middle finger up)
- Accusation (index pointing)
- Live or die decisions in the Roman amphitheater (thumb up/down)

Fall 2002

CS5540

28

Gestures-2

- Hitch hiking (thumb up, hand moving sideways)
- Legal and business transactions (handshake, judge hammering)
- Waving and saluting
- Counting (fingers and/or hand)
- Pointing to real and abstract objects and concepts (index, hand)

Fall 2002

CS5540

29

Gestures-3

- Conducting of an orchestra (variety of both gestures with arms and body)
- Traffic control of cars and airplanes (hands flat pointing or moving)
- Shaping of imagined objects (hands tracing out curves and shapes)
- Martial arts, fighting (variety of movements of arms and body)

Fall 2002

CS5540

30

Gestures-4

- Dance (Balinese dancing)
- Gesturing by singers (hand and body movements)
- Stock exchange operations (various hand shapes)
- Affective gestures (hand touching)
- Rejective (index up moving left & right) / appreciative (hand clapping) gestures

Fall 2002

CS5540

31

Gestures-5

- Game playing (hand signs to communicate with partner in card games)
- Game scoring (cricket, basketball, soccer, rugby, football)
- Dinnertable actions (commanding waiter to refill wine glass)
- Positioning of real (remote or close Control panel operations (mousing, steering a vehicle)

Fall 2002

CS5540

32

Gestures-6

- Moving, touching and interacting with objects
- Silent and non-verbal communication (shrugging, holding one's own earlobe, scratching)
- "Italianate" gestures (two hands open shaking)

Fall 2002

CS5540

33

Gestures-7

- Mimicry and pantomime (actions and objects are depicted with hand/body movements)
- sign language (a complete linguistic communication system)
- Mimicry and pantomime (actions and objects are depicted with hand/body movements)

Fall 2002

CS5540

34

Gestures-7

- Sign language (a complete linguistic communication system)
- Aircraft carrier landings
- Dog training

Fall 2002

CS5540

35

Smart (non-dumb!) Interfaces

- Eliminate the 3-handed interface
 - Keyboard + mouse (impossible situation, really)
 - 2 hands plus voice?
- Another kind of input?

Fall 2002

CS5540

36

Topics for Future

- Ergonomics
- Psychological aspect,
- Smart interfaces / AI
- Building interfaces
 - Designing interfaces
 - Testing
 - Throwing out inadequate ones

Fall 2002

CS5540

37

Conclusions

- This ain't so hard to figure out
- This IS hard to do
 - Take much work, actually
 - UI is expensive, labor intensive
- Have not begun to talk about real AI, just "HI"!

Fall 2002

CS5540

38

End

This Ain't Rocket Science...