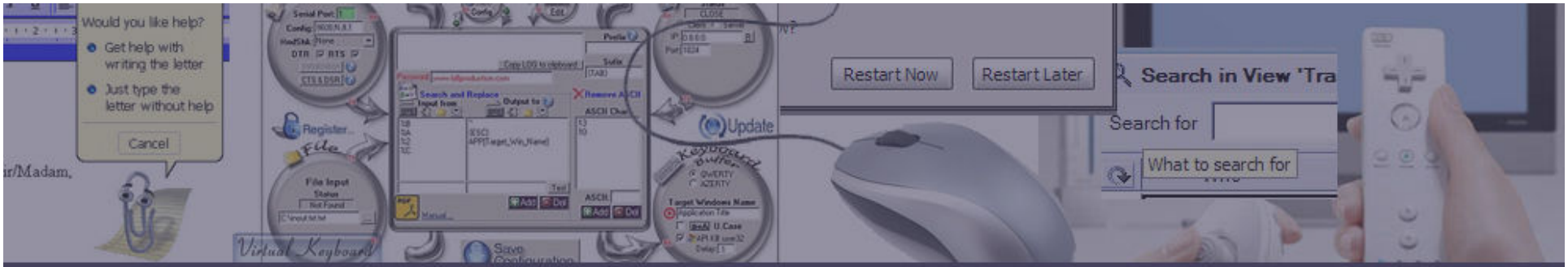
Human Computer Interaction

CSCI 4620 U/G | SOFE 4850

Dr. Christopher Collins

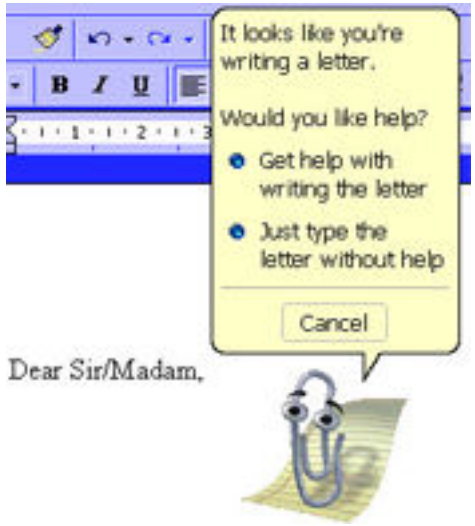
Acknowledgement: Parts of these lectures are based on material prepared by Ron Baecker, Ravin Balakrishnan, John Chattoe, Ilona Posner, Scott Klemmer, and Jeremy Bradbury.

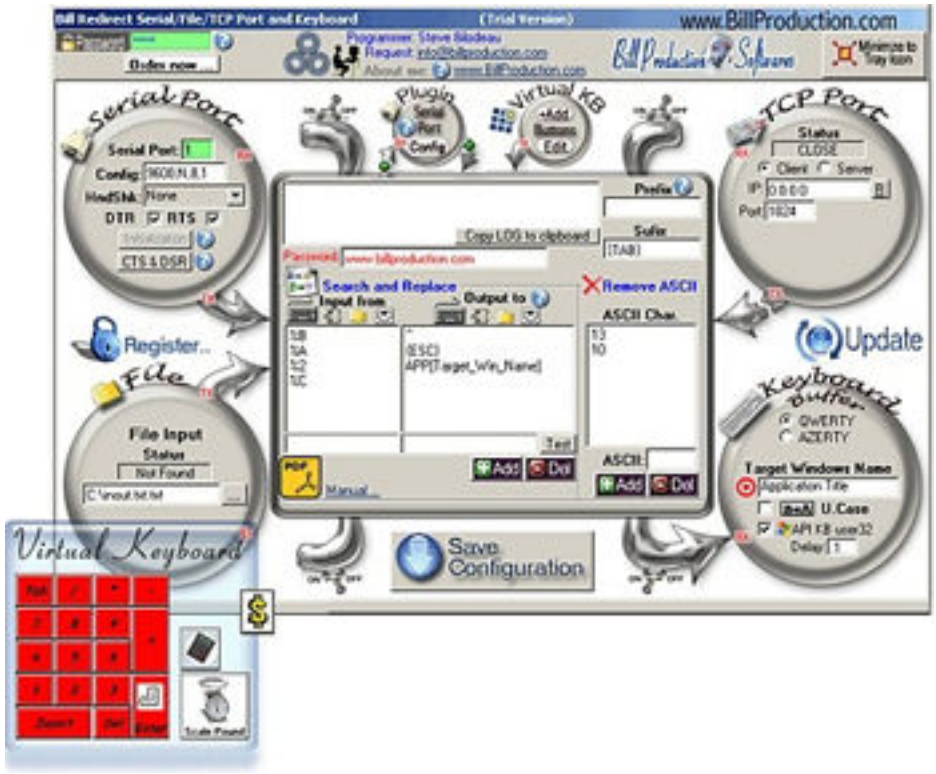
People, not users.



Human-Computer Interaction

Christopher Collins, Ph.D. | UOIT Faculty of Science


It looks like you're writing a letter.
Would you like help?
Get help with writing the letter
Just type the letter without help
Cancel
Dear Sir/Madam,


Bill Redirect Serial/File/TCP Port and Keyboard
(Trial Version)
www.BillProduction.com
Programmer: Steve Rideau
Request: info@billproduction.com
About me: www.BillProduction.com
Bill Production Software
Minimize to Tray Icon
Order now
Serial Port
Serial Port: 1
Config: 9600,N,8,1
HandShk: None
DTR RTS
CTS & DSR
Plugin Serial Port Config
Virtual KB
+Add Buttons Edit
TCP Port
Status
CLOSE
Client Server
IP: 0.0.0.0
Port: 1024
Prefix
Suffix
[TAB]
Copy LOG to clipboard
Password
www.billproduction.com
Search and Replace
Input from
Output to
Remove ASCII
ASCII Char
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10
[ESC]
APPTarget_Win_Name]
Test
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Del
ASCII:
Manual
Register...
Update
File
File Input
Status
Not Found
C:\input.txt.txt
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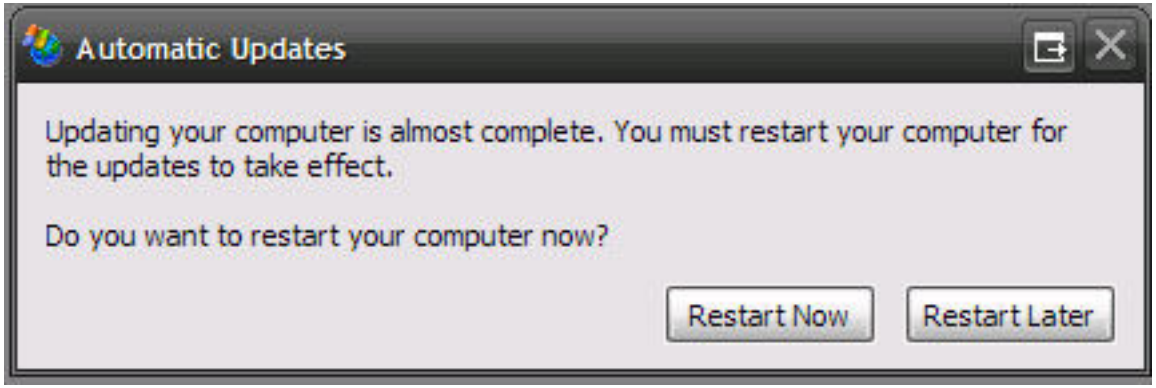
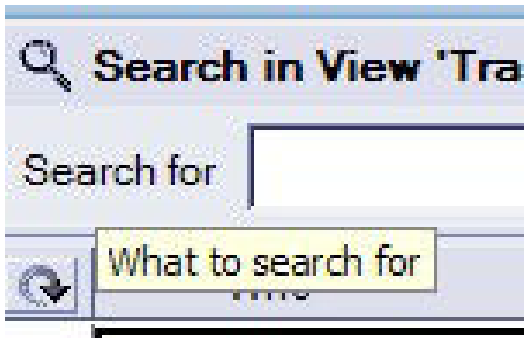
AZERTY
Target Windows Name
Application Title
U.Case
API KB user32
Delay: 1
Virtual Keyboard
Save Configuration
Scale Found


Automatic Updates
Updating your computer is almost complete. You must restart your computer for the updates to take effect.
Do you want to restart your computer now?
Restart Now
Restart Later


Search in View 'Tra
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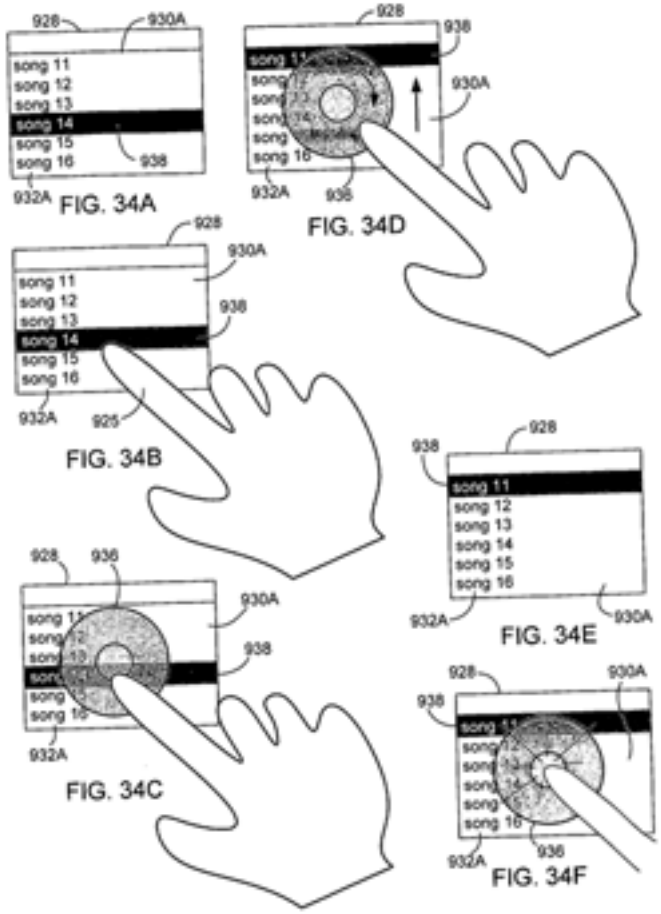
What to search for


BlackBerry
Title:
Sat, May 28, 2008
Plazmic.com
12:48a
http://www.plazmic.com
BlackBerry
12:48a
Delete Item?
Delete
Cancel
Hide Menu
New Address
Compose Email
Options
Close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932A
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FIG. 34B
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FIG. 34E
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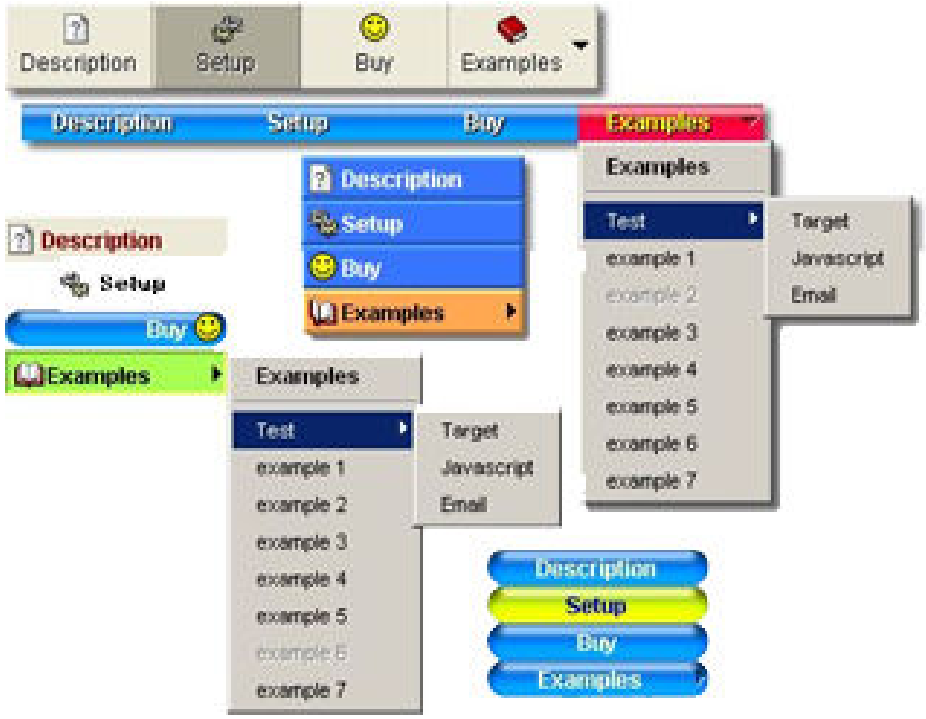
FIG. 34F


Description
Setup
Buy
Examples
Description
Setup
Buy
Examples
Examples
Test
example 1
example 2
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example 4
example 5
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example 7
Target
Javascript
Email
Description
Setup
Buy
Examples
Description
Setup
Buy
Examples
Examples
Test
example 1
example 2
example 3
example 4
example 5
example 6
example 7
Target
Javascript
Email
Description
Setup
Buy
Examples

WHY DOES HUMAN-COMPUTER INTERACTION MATTER?

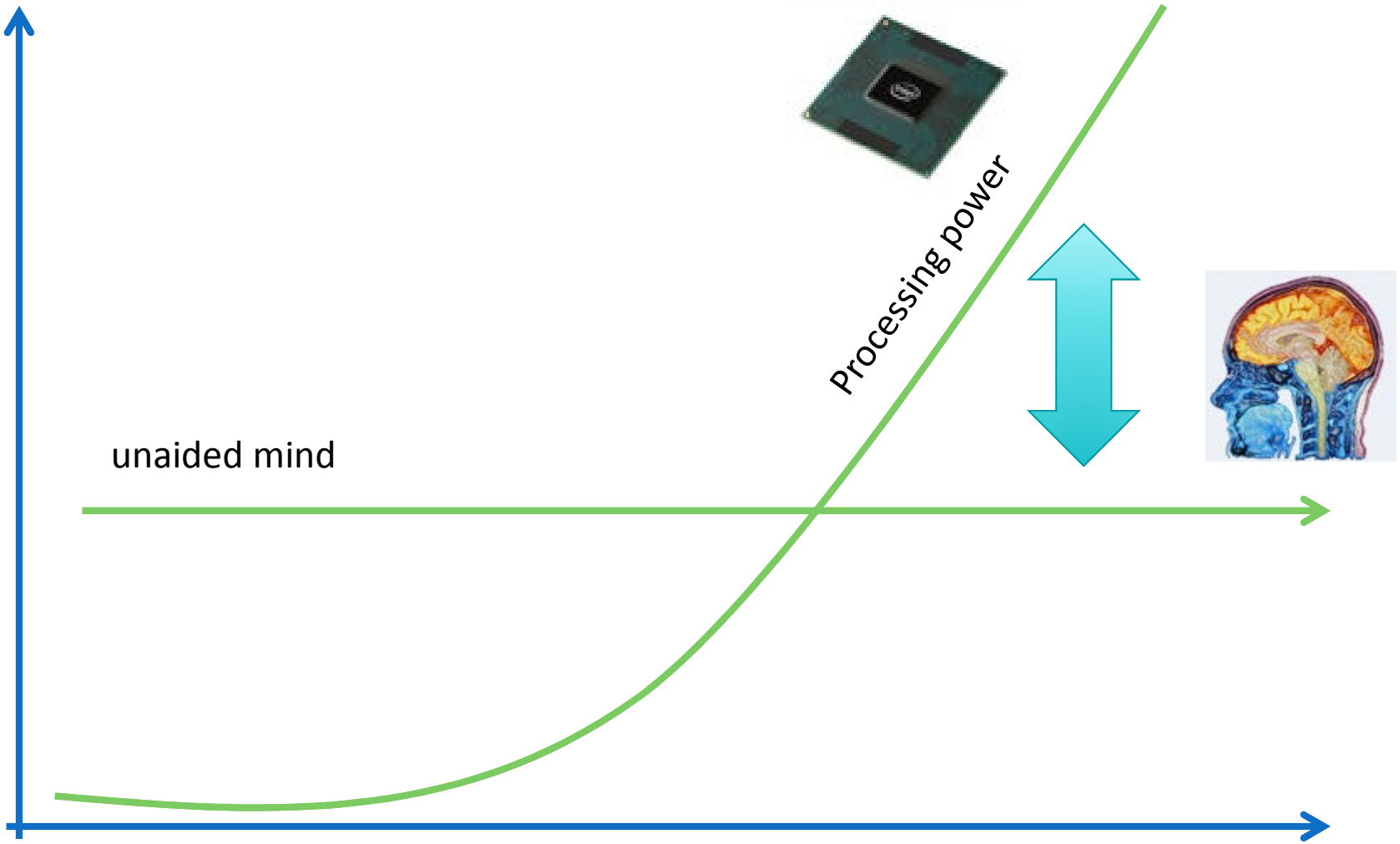
Good design
brings joy

Bad design costs lives, money, and time

10 minutes / day

=330,000,000 minutes / day in Canada

= 628 person years of wasted time EVERY DAY in Canada alone


Processing power
unaided mind

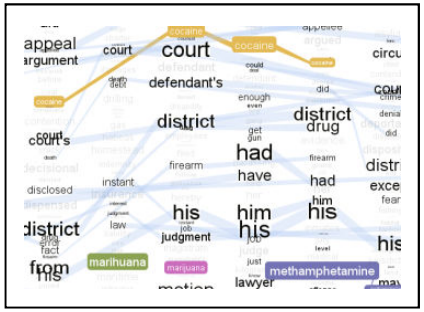
Welcome!

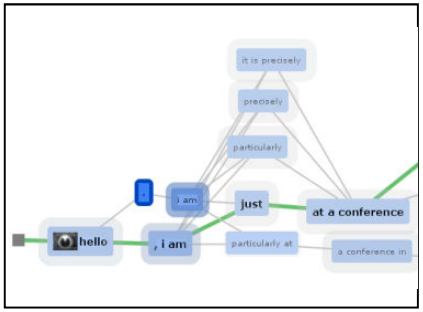
- In today's class we will:
  - Get to know each other!
  - Review the course outline
  - Develop *class norms*
  - Get started with an intro to HCI – EMR Case Study

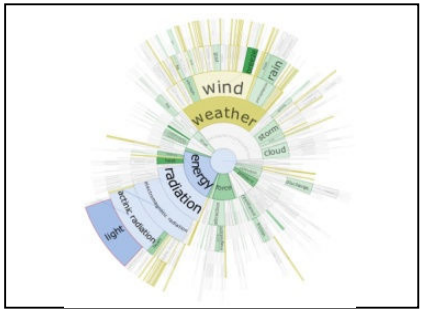
About Me

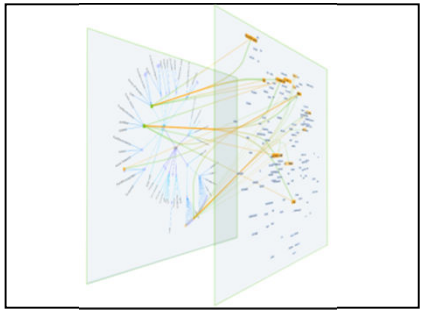
- Canada Research Chair
- Information Visualization & HCI
- Computational Linguistics

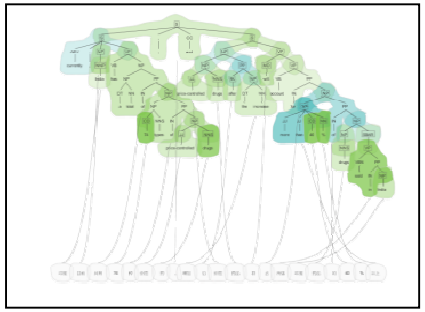
- University of Toronto
- University of Calgary
- Memorial University of Newfoundland











Information Exploration

Text Analysis

NLP Interfaces

Documents

Literary Analysis

Text Collections

Linguistic Analysis

Streaming Data


visualization
data
information
linguistic
VISUALIZATIONS
Figure
Set
Word
text
visual
words
INTERACTIVE
LANGUAGE
document
Example
et
al
design
analysis
Clouds
Edges
corpus
Interaction
layout
Many
Parallel
NLP
Relations
Tag
Uncertainty
spatial
techniques
used
tree
however
members
One
May
Node
see
provide
Sets
use
using
view
research
Translation
within
VisLink
wordnet
nodes
space
items
also
based
Chapter
Lattice
DocuBurst
Community
content
Bubble
Energy
Lattices
Machine
often
Selected
Representations
rights
Plane
Overview
providing
reading
related
large
first
human
interest
DA
faceted
Connection
Examples
Case
best
common
Corpora
Background
Cloud
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documents
edge
Circuit
Area
communication
Cognitive
Colour
computational
different
cases
General
NATURAL
new
Graph
multiple
Divide
Inter-Plane
Patterns
display
method
Path
possible
relationships
RA
processing
particular
results
single
Size
terms
work
types
time
Significant
Term
Process
Structure
problem
statistical
support
visualizing
Two
System
Views
semantic
scores
speech
studies
synsets
relation
search
several
reveal
read
Score
Planes
provides
Order
number
InfoVis

More about my research…

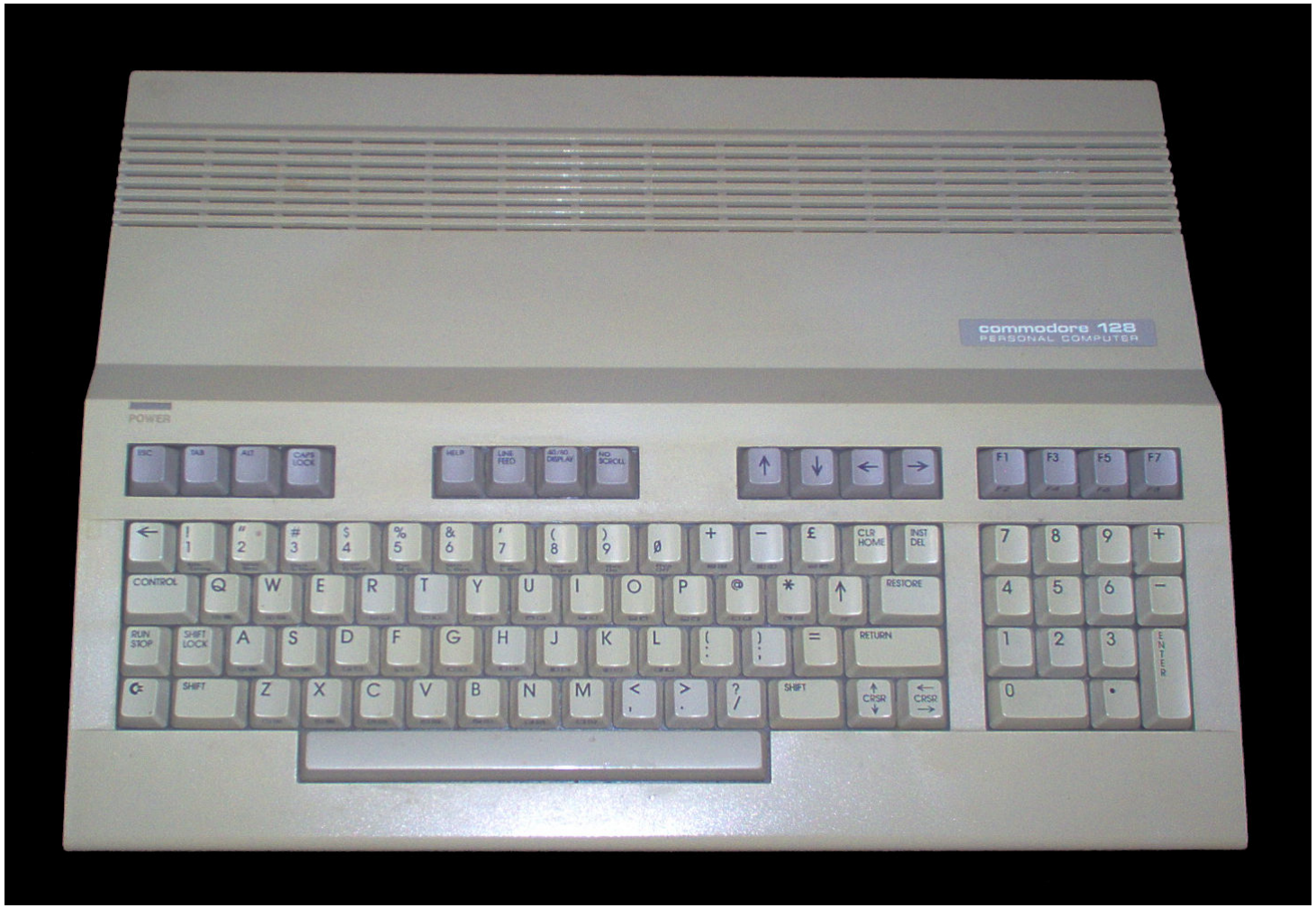
WWW.CHRISTOPHERCOLLINS.CA

Teaching Assistant

HRIM MEHTA

http://vialab.science.uoit.ca/portfolio/hrim-mehta

Why HCI?



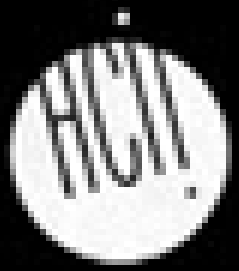
"Put That There" Richard A. Bolt, International Conference on Computer Graphics and Interactive Techniques, 1980.

Skinput: Appropriating the Body as an Input Surface

Chris Harrison
chris.harrison@cs.cmu.edu

Desney Tan
desney@microsoft.com

Dan Morris
dan@microsoft.com



Human-Computer Interaction Institute

Carnegie Mellon

Microsoft

COURSE OVERVIEW

A public service announcement

Schedule

- Lecture:
  - Tuesday 8:10am-9:30am UL 11 (so early…)
  - Friday 9:40am-11:00pm UL 11
- Labs:
  - Tuesday 2:10-4:00 J 123-A
  - Friday 1:10-3:00 J 123-A
  - Attend your registered section!

Contact - Me

- UA 4024 and online:
  - Tuesday 10:00am-11:00am
  - By appointment

  - Blackboard Chat

Contact - TA

- UA 4029 and online:
  - Thursday 11:00am-12:00pm
  - By appointment

  - Blackboard Chat

What might you come talk about?

Talkin’ bout Technology

- Blackboard
- Twitter: #csci4620

- Later:
  - Processing (processing.org)
  - The Simple Multitouch Toolkit (vialab.science.uoit.ca/smt)

Email

- Please use Blackboard to contact me, unless it is urgent (e.g. you will miss your midterm test).
  - Urgent contact info can be found in the syllabus.
- Take time when composing an email - think of it as a professional message to a co-worker.
  - There won't be space for SMS-speak in your work life.
- Email turnaround:
  - Guaranteed: 2 days
  - Average: 1 day
  - Sometimes: 10 seconds
  - … but don’t count on that!

Course Outcomes

- Describe a typical process used to understand people and contexts, enumerate tasks and requirements, and to evaluate the success of implemented interfaces.
- Critique interactive interface design using well-founded theoretical explanations.
- Recognize the impact of human-computer interaction in everyday life situations.

Course Outcomes

- Implement universal design techniques and apply standards for universal accessibility.
- Apply principles of good interface design in the creation of small scale systems.
- Work in small teams on a multi-step project.

Course Outcomes

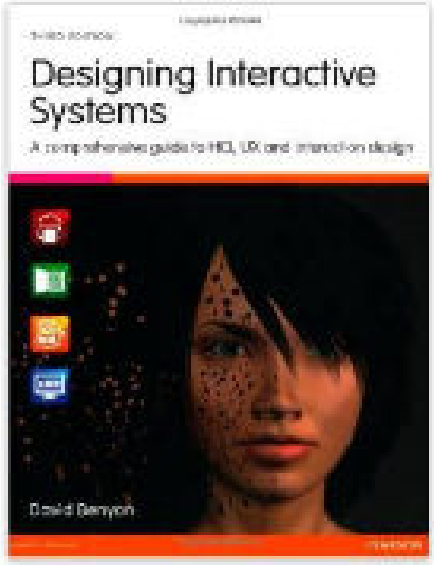
- Write and speak clearly about issues and challenges in hardware and software interface design, specific challenges uncovered during their term project.
- Apply general mathematical models in the assessment of interaction technique efficiency and effectiveness.

Topics

1. Introduction
2. Models & Paradigms
3. Developing a Rich Understanding
4. Evaluation
5. Implementation Issues
6. HCI Case Studies / Research Frontiers

Course Text

- Available at the bookstore & online

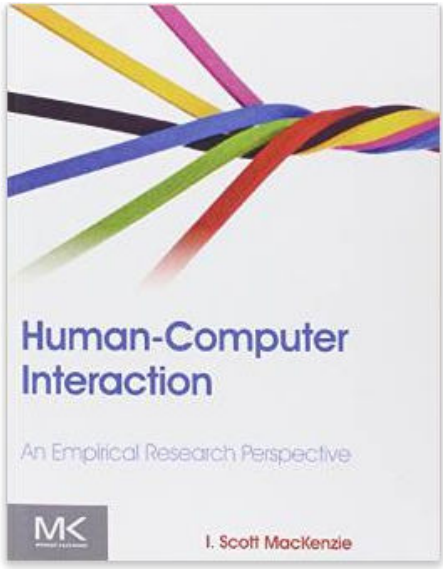


David Benyon. Designing Interactive Systems, 3rd Edition (Pearson Education, 2013).

This book is the primary reference for the course material presented in the lectures.

Reference Text

- Not required, but a useful reference.
- Available online at the UOIT library.

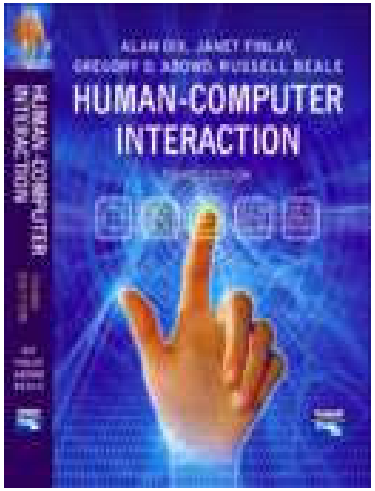


Mackenzie, I. Scott. Human-Computer Interaction: An Empirical Research Perspective, 1st ed. (Morgan Kauffman, 2013).

This book is a reference for the course material presented in the lectures.

Reference Text

- Not required, but a useful reference.
- Available to borrow from me.



Alan Dix, Janet Finlay, Gregory D. Abowd, Russell Beale. Human-Computer Interaction, 3rd Edition (Pearson Education, 2004).

This book is a reference for the course material presented in the lectures.

Required Readings

- Most weeks, 1+ required readings and/or videos will be posted on Blackboard
  - Textbook chapters
  - Videos
  - Research papers
  - Media articles
  - Blog entries
- They are *required*, as in *you have to read them*.
- Readings will be included in the mid-term and final exam.

Evaluation - Undergraduate

Item	Value
Participation	3%
Labs	10 X 1% = 10%
Mid-term test	20%
Group project	45%
Final exam	22%
Total	100%

Evaluation

Item	Value
Participation	3%
Labs	10 X 1% = 10%
Mid-term test	20%
Group project	45%
Final exam	22%
Total	100%

Lectures and Blackboard

Interim grade report after 5 weeks = opportunity to improve

Evaluation

Item	Value
Participation	3%
Labs	10 X 1% = 10%
Mid-term test	20%
Group project	45%
Final exam	22%
Total	100%

Attendance is required. Short activities submitted during lab, often related to term project.

Evaluation

Item	Value
Participation	3%
Labs	10 X 1% = 10%
Mid-term test	20%
Group project	45%
Final exam	22%
Total	100%

Covering material up to the lesson before the test on October 17.

Evaluation

Item	Value
Participation	3%
Labs	10 X 1% = 10%
Mid-term test	20%
Group project	45%
Final exam	22%
Total	100%

Multi-part project

Groups of 3 or 4

Grad students: form grad student teams

Submitted in 8 parts

Evaluation

Item	Value
Participation	3%
Labs	10 X 1% = 10%
Mid-term test	20%
Group project	45%
Final exam	22%
Total	100%

Cumulative on the whole term.

Evaluation – Graduate Students

Item	Value
Participation	3%
Labs	10 X 1% = 10%
Mid-term test	10%
Group project	45%
Individual Assignments	2 x 10% = 20%
Final exam	12%
Total	100%

2 assignments based on readings and lecture materials. These are individual assignments, with a strong design component.

Individual vs Group Work

- ***Must pass individual portion of the grade to pass the class!***

Labs

- If you miss a lab due to illness or a death in the family, you must obtain the appropriate documentation (UOIT Medical Certificate, death certificate) and submit it to the course instructor within five business days of missing the lab.
- As space allows, and with a legitimate reason, it may be possible to attend a different lab section or complete a lab on your own time. Contact your TA in advance for approval.
- **Absence from more than two labs, regardless of any documented reasons, will result in a grade of F for the course (see** http://www.science.uoit.ca/undergraduate/current-students/academic-policies.php).

Labs

- **10 labs total**
- **No labs on the weeks of Sept 8-12, Oct 6-10, Dec 1-5**
- **Lab schedule in the labs folder on Blackboard**

Tutorials?

- SOFE 4850 students are registered for *tutorials*
- CSCI 4620 students are registered for *labs*
- The contact hours are the same.
- Thus, you can think of the labs as tutorials – they reinforce course materials through activities and offer an opportunity to meet with the teaching assistant.

Tentative Course Dates

Wednesday, Sept 10	Term project part 1a due (participation)
Thursday, Sept 18	Term project part 1b due (1% for submitting; must submit and receive approval before proceeding)
Friday, Oct 3	Term project part 2a due (5%)
Friday, Oct 17	**Midterm test (20%)**
Sunday, Oct 19	Term project part 2b due (9%)
Thursday, Oct 30	Term project part 3a due (7%)
Sunday, Nov 23	Term Project part 3b due (13%)
Friday, Nov 28	Term project part 4a presentations (3%)
Wednesday, Dec 3	Term project part 4b due (7%)

Assignments are due on Blackboard at 11:59pm on the due date.

Late Assignments

- Extensions on request with valid reason.
- Without reason:
  - Subtract 10% each day or part day (including weekends)
  - Maximum 4 days late, then not accepted
- Caution! The term project is *cumulative* so extensions will cut into the time for the next part!

Remarking

- “Chris, this is totally stupid. You didn’t tell us about X or Y, and anyway, I think I’m right.” = 0% change
- It is very important that all assessments are fairly graded. If you think there is a problem, please submit an explanation, *by email*, within 7 days of receiving the grade.
- No requests accepted in class or more than 7 days later.

Accessibility

- Please speak to me as soon as possible.
- Accommodations can also be arranged through the Student Accessibility Services (see syllabus).

Academic Integrity

- You work must be your own: if you quote others, cite them appropriately.
- You may not work together, except on the group term project. Groups may not collaborate unless explicitly asked to do so.
- Academic misconduct is a serious offense, and will be handled under UOIT policies.
  - Note: 'allowing one's work to be copied' is an offense too.

What I expect of you…

- Come to class on time and prepared
- Read the assigned readings
- Participate in discussions in class and online
- Ask assignment-related questions early
- Do not spend class time playing games, surfing the Web or doing work for other courses
- ??

You should expect from me…

- Knowledgeable and prepared for class
- Fair grading
- Responsive to comments and suggestions
- Timely return of assignments
- Keep things interesting and relevant
- Ensure a welcome and accessible classroom
- ??

You expect from each other…

- Participate fully in your group
- Respect the time of group members
- Understand everyone has different abilities
- Encourage and organize to use strengths
- Welcome discussions and comments
- Pay attention to class presentations (laptops closed)
- ??

Case Study: Interfaces that kill.

Electronic Medical Records

- Idea: replaces paper charts with database file
- Potential advantages:
  - Accuracy / cross checking
  - Data sharing
  - Data mining / aggregation
  - Decision support
  - Efficiency improvements
  - Others?

Problems?

- What do you think could be some problems with such a system?

What the Medical Staff Say

- See Usability Pain Points PDF

Source: EHR Usability Pain Points Survey Q4-2009, Ribitzky, Sterling, and Bradley, Proc. HIMSS 2010

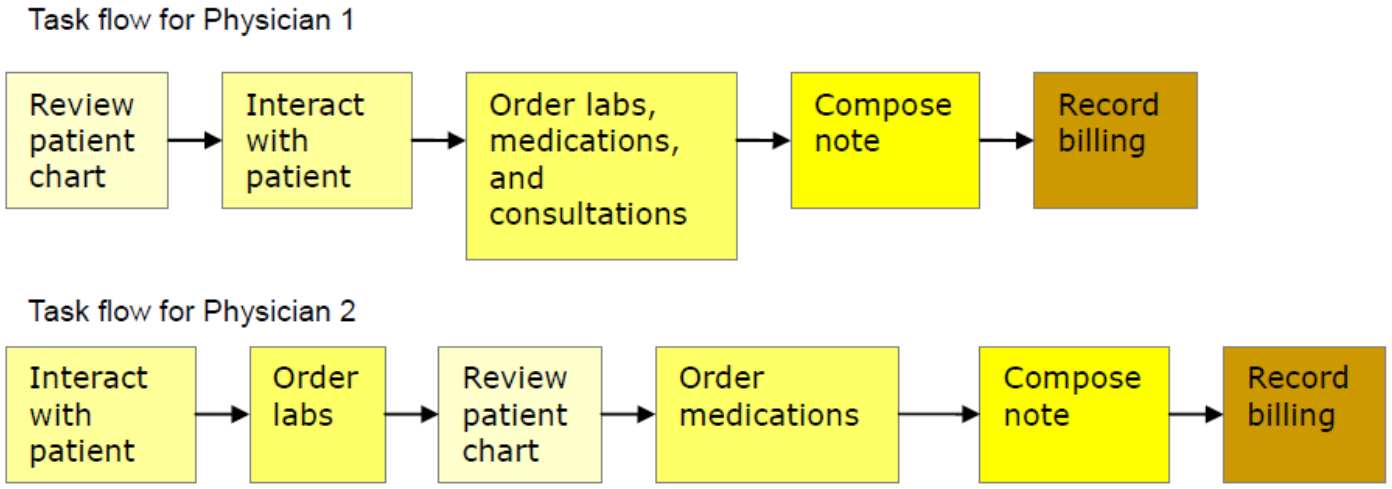


Figure 2. Two different task flows for the same task

Usability of Electronic Medical Records
John B. Smelcer, Hal Miller-Jacobs, and Lyle Kantrovich
Journal of Usability Studies, Volume 4, Issue 2, February 2009, pp. 70-84

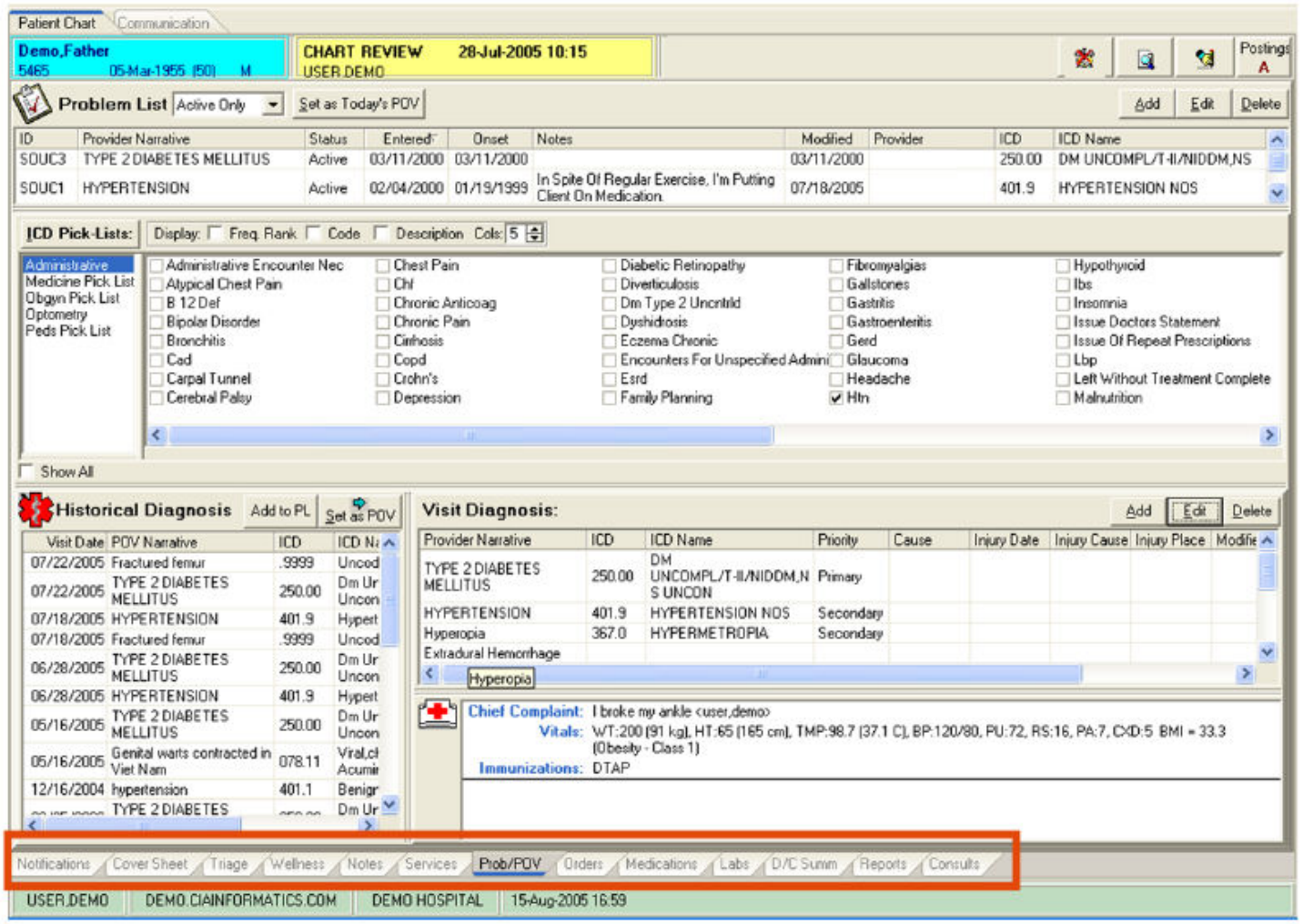


Figure 3. EMR navigation with no feedback on completed steps

Usability of Electronic Medical Records
John B. Smelcer, Hal Miller-Jacobs, and Lyle Kantrovich
Journal of Usability Studies, Volume 4, Issue 2, February 2009, pp. 70-84

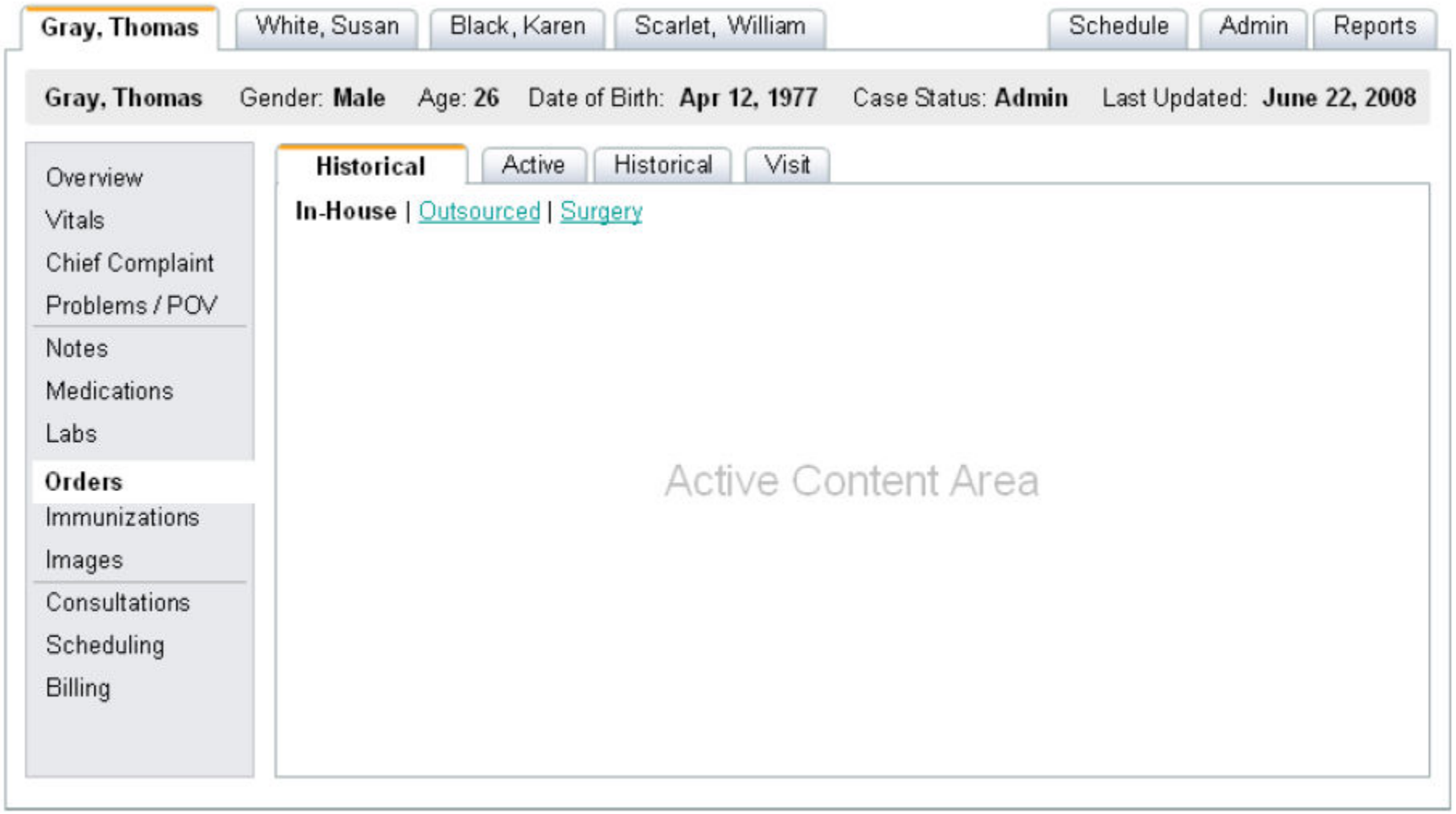


Figure 5. Possible navigation model with multiple levels

Usability of Electronic Medical Records
John B. Smelcer, Hal Miller-Jacobs, and Lyle Kantrovich
Journal of Usability Studies, Volume 4, Issue 2, February 2009, pp. 70-84

Things you may not think of…

http://money.msn.com/now/blog--more-doctors-are-switching-to-cash-only-practices

- Physical barrier
- Leads to focus on technology
- Leads to closed-ended questions (related to check boxes)

Usability Problems Can Kill

- Over/under dosing
- Communication failure (double ordering)
- Wrong patient
- Allergies (“alert fatigue”)

http://www.healthleadersmedia.com/page-1/TEC-293675/EHR-Design-Flaws-Contribute-to-Patient-Harm-in-the-ED

Ongoing Course Evaluation

- Feedback form in lecture folder:

Lecture 1 Daily Feedback

Your Action Items

- Read the “Group Project Roadmap” handout before next class
- Read posted required readings
- Start thinking about problems which may be solved using tabletop, wall display, or multitouch technology
- Post your personal introduction to the discussion board for Part 1a

Summary

- Today we:
  - Introduced the scope of this course
  - Discussed the class structure
  - Outlined course policies

Announcements

- Labs start Sept 16

Next Class

- Introduction to term project