CPSC 481

Foundations and Principles of Human Computer Interaction

James Tam

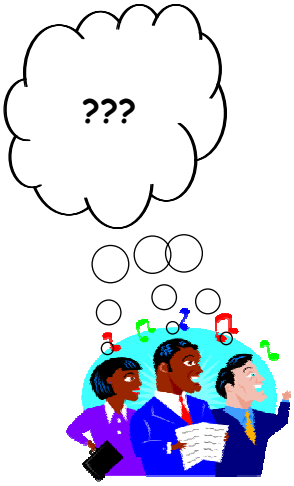
CPSC 481 Administrative

James Tam
- Human-computer interaction (HCI)
- Computer-supported cooperative work (CSCW)
- Change awareness
- Games
- http://www.cpsc.ucalgary.ca/~tamj/481

Contact information
- Email: tamj@cpsc.ucalgary.ca
- Phone: 210-9455
- Office: ICT707

Office hours
- Office hours: MT 16:00 – 17:00
- By email any time
- By appointment: email or phone to arrange one
- Drop in for urgent requests (but no guarantees!)

Feedback



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How You Will Be Evaluated

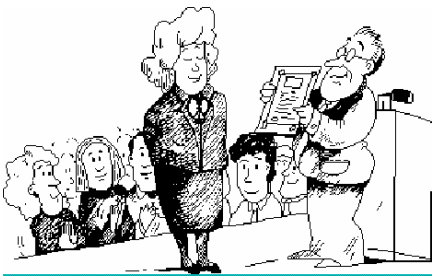
1) Assignments (50%)

- Portfolio:
  - Assignment 1 (*TA marks it*): Task centered design and prototyping (13%)
  - Assignment 3 (*I mark it*): System redesign, implementation, and evaluation (25%)
- Usability study:
  - Assignment 2 (*TA marks it*): Usability evaluation of a large system in everyday use (12%)

2) Exams (50%)

- Mid-term (20%)
- Final (30%)

Note: you must pass the exam and the assignment components to get a C- or higher in the course



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Group Work

Information about the group evaluation mechanism:
http://pages.cpsc.ucalgary.ca/~tamj/481/groupEvaluations.html

Tutorials

Critical to your success in assignments

- Elaboration of assignment specifications
- Discuss intermediate results (e.g., presentations)
- Feedback on graded assignments
- Learn specific skills

Textbooks And Additional References

Lecture notes (required)

- Sold at cost by the Copy Center
- Also available on the web (http://www.cpsc.ucalgary.ca/~tamj/481/)

Text books (optional)

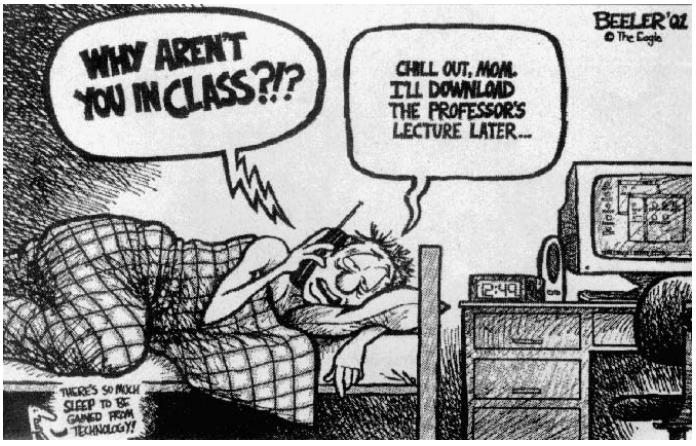
- Interaction Design: Beyond Human-Computer Interaction by Sharp, Preece and Rogers.
- Readings in Human Computer Interaction: Towards the Year 2000 (2nd Edition) by Baecker, Grudin, Buxton and Greenberg
- You can also choose whatever programming manual that you like best

Extra readings

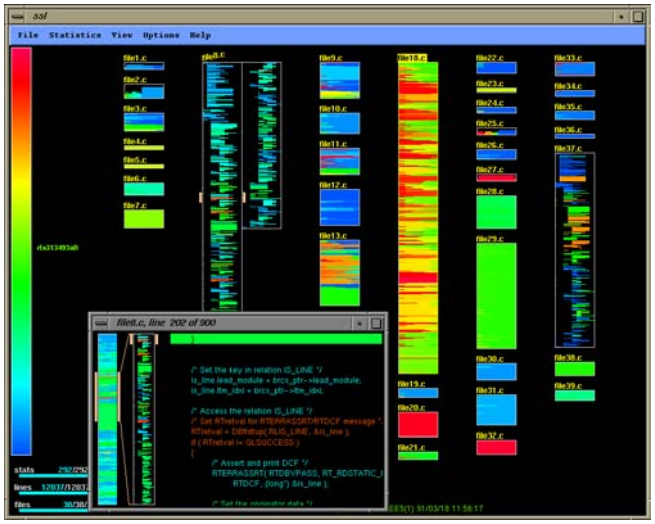
- Some will be required (could be on the exam), some are optional (not specifically on the exam)

How To Use The Course Resources

- **They are provided to support and supplement lectures**
- **Neither the course notes nor the text books are meant as a substitute for regular attendance to lecture and tutorials**



Encourage Comparison Between The Data



1) *"Seesoft—A Tool for Visualizing Line Oriented Software Statistics"*, Eick S.G., Steffen J.L. and Sumner E.E

Encourage Comparison Between The Data

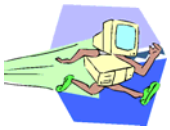
If you miss a class make sure that you catch up on what you missed (get someone's class notes)

...when you do make it to class make sure that you supplement the slides with your own notes (cause you aint gonna remember it in the exams if you don't)

1) *"Seesoft—A Tool for Visualizing Line Oriented Software Statistics"*, Eick S.G., Steffen J.L. and Sumner E.E

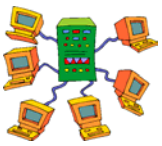
Human-Computer Interaction (HCI)

Most of Computer Science deals with the 'technical' side of computers.



Run computers faster!

Make computers store more information!!



Increase the networking capabilities of computers!!!

- These technical issues (and others) are all very important but something is still missing...

Human-Computer Interaction

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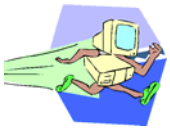

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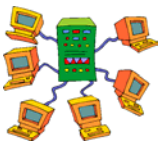


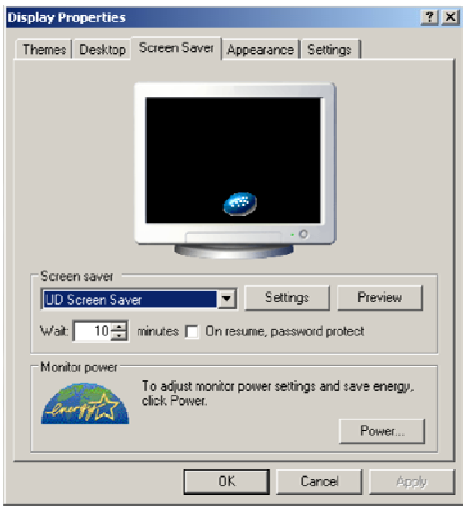
Increase the networking capabilities of computers!!!

- These technical issues (and others) are all very important but something is still missing...

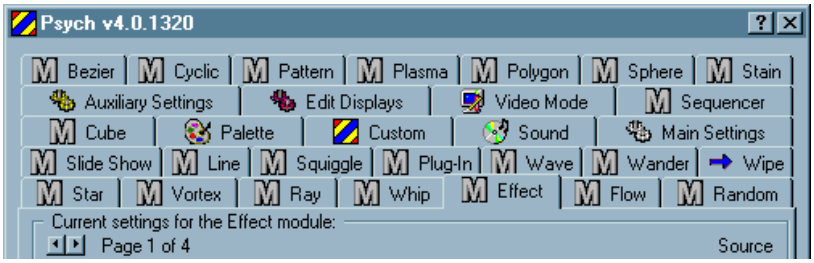
Human-Computer Interaction

- **...but don't forget about the other side of the relationship.**
- **No matter how powerful the computer and how well written is the software, if the user of the program can't figure out how it works then the system is useless.**
- **Software should be written to make it as easy as possible for the user to complete their task. (Don't make it any harder than it has to be).**
- **This is just common sense and should/is always taken into account when writing software?**

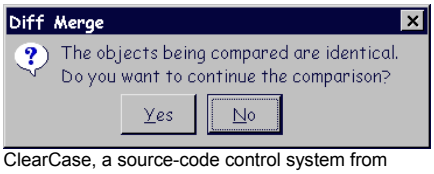
Human-Computer Interaction: Not Just Common Sense Information



Human-Computer Interaction: Not Just Common Sense Information (2)

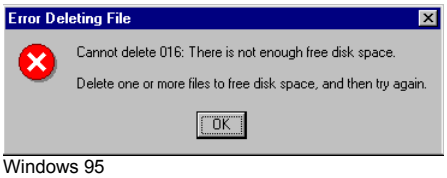


Human-Computer Interaction: Not Just Common Sense Information (3)



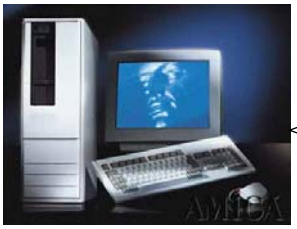
ClearCase, a source-code control system from Rational Software

Uhhh… I give up on this one [Mac shareware version of RISK]



Windows 95

Human-Computer Interaction (HCI) Deals With The Interaction Of A Person With A Computer



Technological perspective

Human perspective

Human Perspective

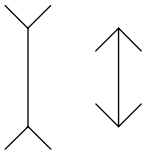
- **People are vastly different from computers**
  - (Gee no kidding!)
- **Some differences between people and computers (from "*Things that make us Smart*" by Don Norman)**

View	People are	Machines are
Machine centered view	**(Weaknesses of people)** • Vague, disorganized, distractible, emotional, illogical	**(Strengths of machines)** • Precise, orderly, cannot be distracted, unemotional, logical
People centered view	**(Strengths of people)** • Creative, compliant, attentive to change, resourceful, able to make flexible decisions based on context	**(Weaknesses of machine)** • Dumb, rigid, insensitive to change, unimaginative, constrained to make consistent decisions

Human Perspective (2)

So the characteristics of people who will use the program must be accounted for:

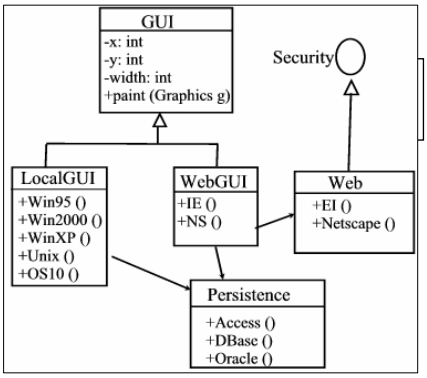
- Account for people's weaknesses
  - e.g. 1, people can be poor at remembering things, computers can store vast sums of information.
  - e.g. 2, human perception can be deceptive



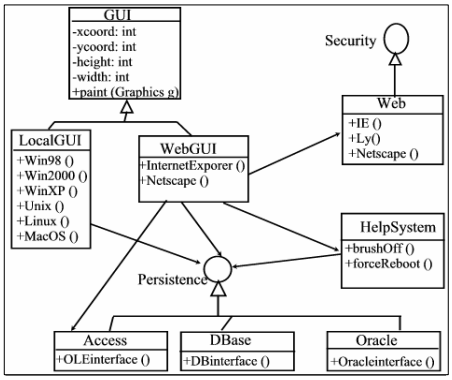
Human Perspective (3)

- Take advantage of people's strengths (this first approach does not)

Before

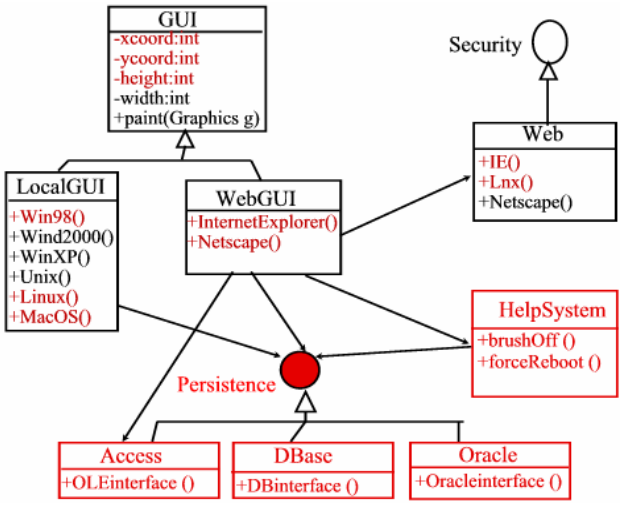


After



Human Perspective (4)

- Take advantage of people's strengths (this second approach does so)



Human Perspective (5)

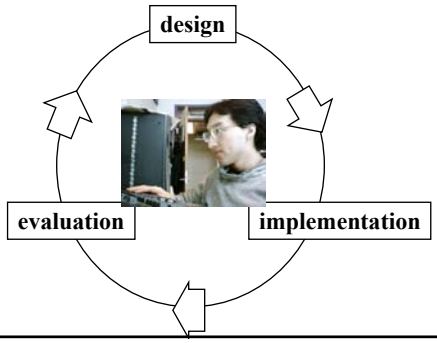
- **Also differences between different groups of people must also be considered**
  - Physical differences: sensory capabilities, size, shape
  - Psychological differences: language and culture
  - Differences in skills and experience
  - Usage differences: different people may complete the same task in vastly different ways

Human-Computer Interaction

A discipline concerned with the:

design,
implementation and
evaluation

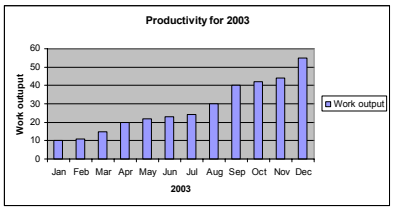
…of interactive computing systems for human use



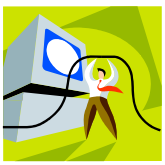
HCI Is Concerned With The Usability Of A System

Some measures of usability:

- Effectiveness
  - Does the system let the person do what they need to do?
  - Does it support the user's goals and tasks?
- Efficiency



- Satisfaction



The Historical Context Of Usability: Apply It Like Peanut Butter.

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The Historical Context Of Usability: The Priest With A Parachute Paradigm.

"We want to get all the functionality working and debugged and then we'll worry about that usability stuff."

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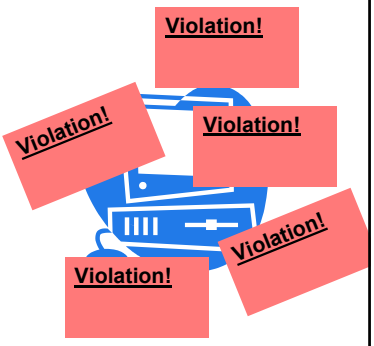
The Historical Context Of Usability: HCI People Are The UI Police.

Programmers hide your code!



Terminator 2 © Artisan Entertainment

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The Historical Context Of Usability: It's Important

Software should be **friendly and **usable** but how do we do it?**

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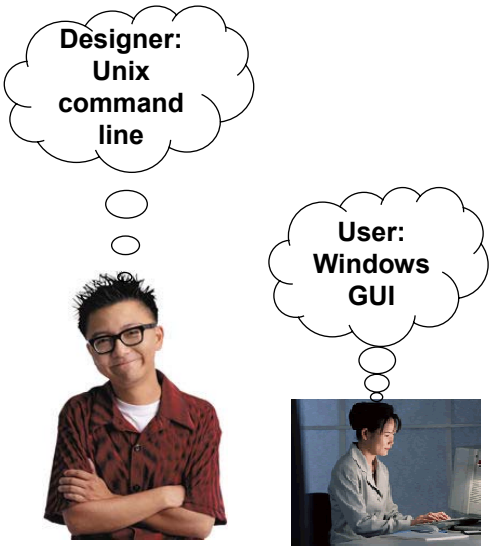
Why An Interface Design Process? Why HCI And Usability?

63% of large software projects go over cost

- Managers gave four usability-related reasons
  - Users requested changes
  - Overlooked tasks
  - Users did not understand their own requirements
  - Insufficient user-developer communication and understanding

Usability engineering

- Pay a little now, or pay a lot later!
- Far too easy to jump into detailed design that is:
  - Founded on incorrect requirements
  - Has inappropriate dialogue flow
  - Is not easily used
  - Is never tested until it is too late



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Importance Of Human-Computer Interaction: Cost Of Using A Computer

Costs from a technical perspective

- Hardware costs
- Software costs

Costs from the user's perspective (personware)

- Training costs
- Daily usage

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Another Motivation For Human-Computer Interaction

When there is a computer-human interaction most often the bottleneck slowing down the process is the person and not the computer.

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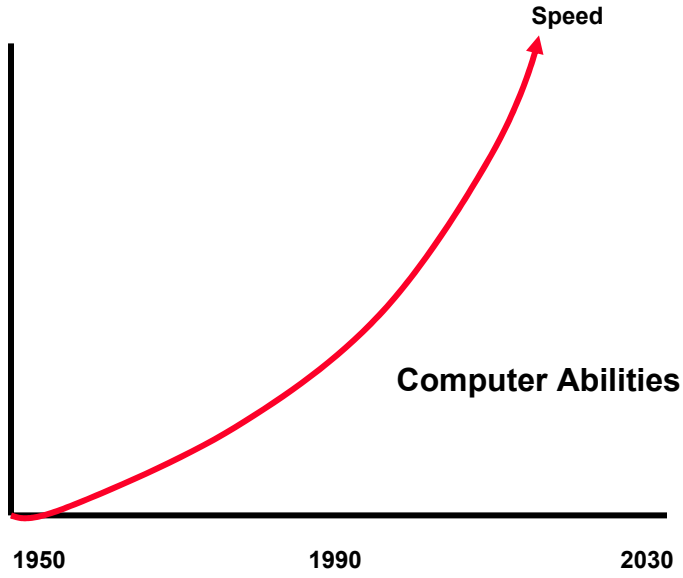
Moore's Law



These graphs are variations of those presented by Bill Buxton

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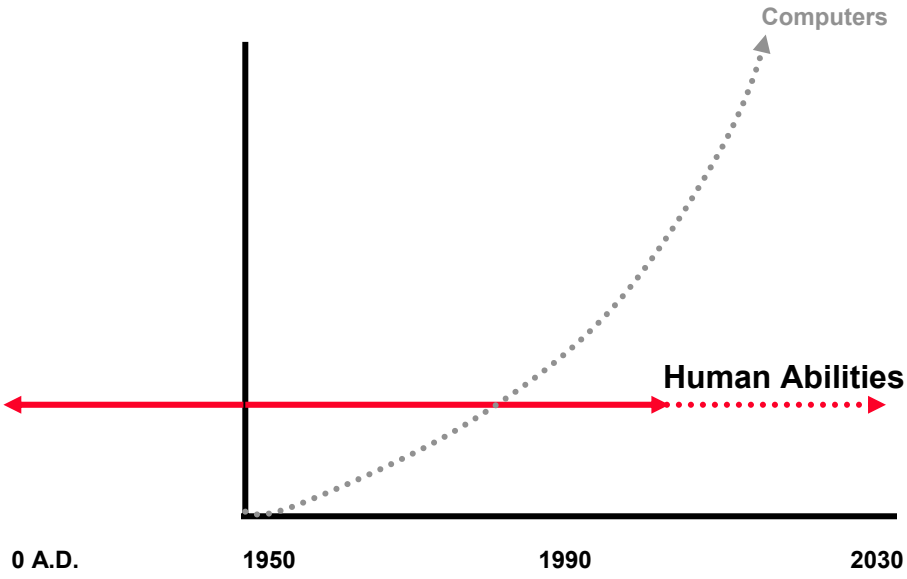
People



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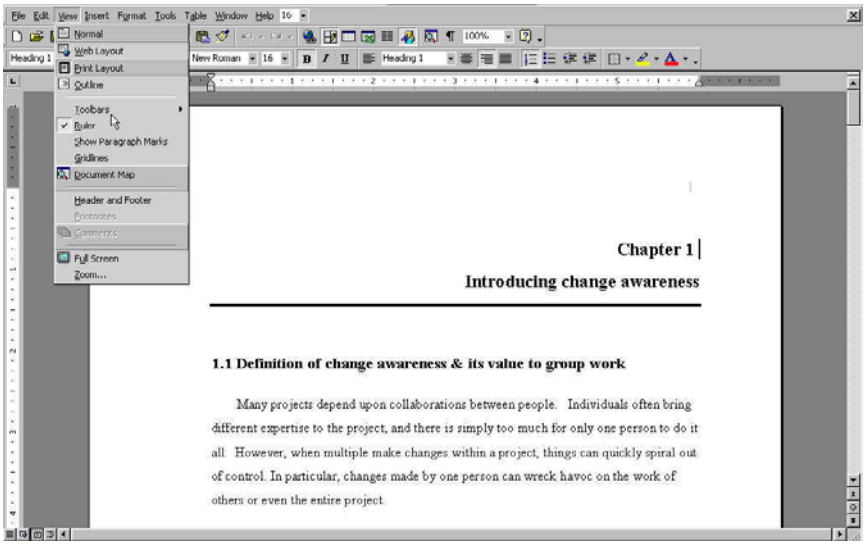
HCI.. Not Just Graphical Interfaces For Novice Users



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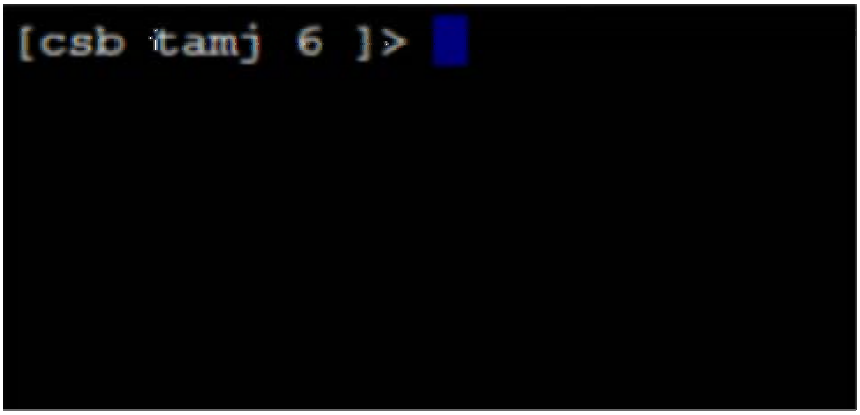
HCI.. Not Just Graphical Interfaces For Novice Users: A Good Interface? (2)



Course Objectives

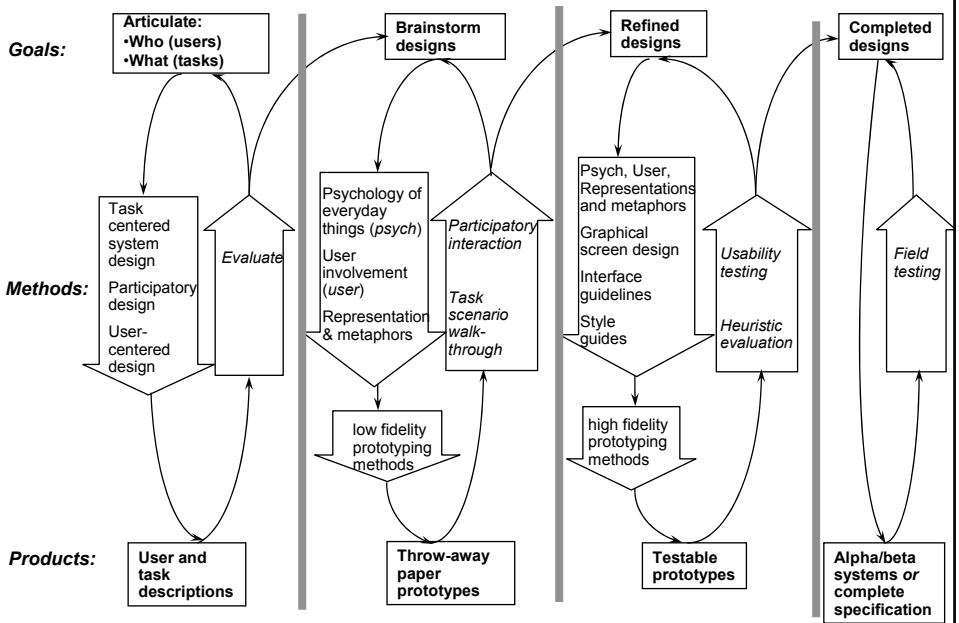
At the end of this course, you will

- Know what is meant by good design (guidelines and models that can be applied to interface design)
- Know and have applied a variety of methods for involving the user in the design process
- Have experienced building applications through various methods and systems
- Know and have applied methods to evaluate interface quality
- Have sufficient background to
  - Apply your training in industry
  - Continue your education

What 481 Is Not About

- **The theory and mechanics of GUI programming**
  - The focus is on learning how to design a usable system rather than learning about how a GUI works.
- **How to programming with a GUI language e.g., C# programming**

Interface Design And Usability Engineering



This diagram is a variation of the one presented by Saul Greenberg