ECSE 424/681
Human-Computer Interaction (HCI)

www.cim.mcgill.ca/~jer/courses/hci
Exercise

- pretend it’s 1970: draw a computer
- back to 2014: draw a computer
1970s era
Which part is the computer?
How many people drew this?
Our view of the computer is inherently tied to the interface
Agenda

- Administrivia
- What is this course all about?
- Is it right for me?
- Intro to Don Norman’s POET
- A few exercises
Course Web Site

- www.cim.mcgill.ca/~jer/courses/hci
  - evaluation
  - readings (you must be logged on to a McGill computer system in order to download the readings from the ACM web site)
  - term project info and (some) exercises
  - other course resources
Office Hours

- Thursday 10-11:30 in MC 424
- Text-based electronic communication is a poor substitute for face-to-face or video-mediated communication -- if you have course-related questions, please attend office hours
- however, on-line discussion encouraged …
On-line Class Communication

- discussions previously on myCourses
- but this is a class on **good** human-computer interfaces… enough said
- instead, we’re using Piazza, which supports:
  - group discussions (bulletin board)
  - collaborative (Wiki-style) Q&A
  - private communications (please use this, not email, to reach me)
  - unlike some other tools, appears to be usable by human beings
Term Project Themes: Previous Years

- **pre-2011**: physically distributed, multimodal, context-aware systems

- **2011: making life easy**: technologies for education, healthcare, transportation, communication, work, etc. that serve people first

- **2013: technologies for the visually impaired**: interactive systems to assist the blind and visually impaired community

- **2014 winter: games for rehab**: facilitate physical, speech, or memory rehabilitation
Term Project Themes: Fall 2014

- up to you!
- this semester, you’re invited to propose your own topic
- only requirements:
  - focus of effort is on HCI (more on this later)
  - instructor approves of project and scope
How will this work?

- brainstorm of problem category and type of solution(s)
- guided observation of target user population
- refine project idea to best serve users’ needs
- obtain instructor approval
- validate idea
- submit project proposal
Why not to take this course

- you don't get an A for memorizing or being a great mathematician
  - Fitts’ Law for movement tasks: $ID = \log_2 (2A/W)$
- it's going to be challenging and a lot of work
- sample comment from a previous course evaluation:

  "I do know that I have worked harder in this course than in some 5 credit courses I have taken and probably will not do as well..."
Why take this course?

- it's going to be challenging
- you'll learn valuable skills
- you’ll get a chance to be creative and exercise your design skills
- continuing the previous course evaluation comment:
  
  “.. This is more than made up by the interesting content of the course and overall quality of the lectures.”
What is HCI? A simple definition:

"... about designing computer systems that support people so that they can carry out their activities productively and safely."
An even simpler definition

"…the study of people, computer technology and the ways these influence each other."
The Psychopathology of Everyday Things

Don Norman
guru of “good design”
(now has a course on Udacity)
Here’s a thought

“In the everyday world, we interact with tens of thousands of objects, yet generally manage to use them properly the first time they are encountered.”
Making sense of everyday objects

- subtle clues
  - in public buildings do doors swing in or out?
  - we learn that about doors by experience
  - if there is no handle then we ‘know’ to push
Affordances

“actionable properties between the world and an actor”
J.J. Gibson, 1977, 1979

“the [perceived or] actual properties of an object that determine how it could be used”
Don Norman, 1988
Actual vs. Perceived Affordances

- with opposing male and female surfaces and featureless sides, Lego naturally afford plugging into one another
- clicking while the mouse cursor is on an image on the screen does something particular
Constraints

- Missing pins at right of female DVI-D connector prevents insertion of male DVI-I cable.

- These can only be inserted one way, although it’s not necessarily the most clearly visible.

- 3.5" diskette

- Dual Link DVI-I

- Dual Link DVI-D

- USB
Conceptual Models

The difficulty for the designer is to find a way to make the design model obvious to the user via the system delivered to the user.

If the system image does not make the design model clear and consistent, the user will end up with the wrong mental model.
Using the Conceptual Model

- our understanding of how things work
- allow us to make predictions about behaviour

Our mental models of how bicycles operate can "simulate" this to know it won't work
Bad Example

From the user’s perspective, the conceptual model is arbitrary, and therefore must be taught

- affordances
  - four push buttons afford pushing
- constraints
  - any button (or combination?) can be pressed at any time
- relationships between controls and results
  - not clear what the buttons do
    - no obvious relation between them and end-result of actions
Mappings

- relationships between controls and the things being controlled
- allow us to predict the effects of our actions
- “natural mappings” take advantage of physical analogies and cultural standards for immediate understanding
Exercise (2 minutes)

- design a controller to adjust your car seat, allowing you to:
  - raise/lower the seat
  - tilt the seat forward/back
  - slide the seat forward/backward
  - raise/lower the headrest
Exercise (3 minutes)

- exchange your design with the person sitting next to you
  - which one appears easier to use? why?
  - can you suggest any improvements?
Mercedes sedan
Another reason to take the course

- you get marks for ripping apart the flaws in other people's work

  (provided you supply constructive criticism: i.e., “what should they have done?”)
Video: Intelligent Home Critique
Recap

- Office hours: Thursday 10-11:30 in MC 424
- Piazza for course communication
- Course website: www.cim.mcgill.ca/~jer/courses/hci
- Introduced terminology from Norman’s POET
- Considered some important issues of usable (and unusable) system design
Homework

- This week:
  - Exercise 1: Yearbook page (due Sept. 7)
  - Exercise 2 Design Critique (due Sept. 9)
  - Readings and videos
Next Class Agenda: Alan Kay

- “The best way to predict the future is to invent it.”

- Brought us the concept of laptop and tablet computers in 1968

with Dynabook prototype