

THE VISUAL INTERFACE

Human Visual Perception

1 Includes material from
Dix et al, 2006, Human Computer Interaction, Chapter 1

LEARNING OUTCOMES

- What are the two stages of the visual system?
- How do luminance and colour effect visual perception?
- What is the difference between central and peripheral vision?
- How do we read?

- How do we realize design?
- What should we consider?
 - Technical
 - Visual
 - Interaction
 - Search
 - Context of use
 - Information
 - Interacting/ transacting

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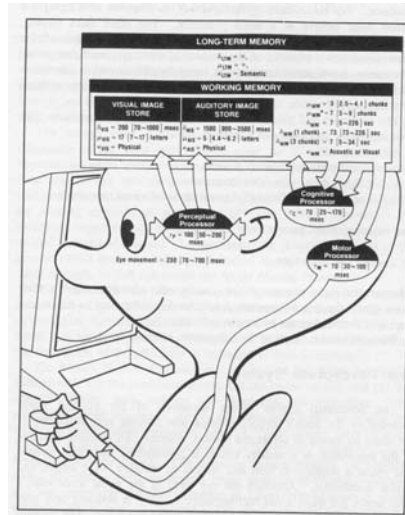
REALIZING THE VISUAL INTERFACE

- Human visual systems
- Visual aesthetics
- Grouping
- Lines Borders & Tables
- Text
- Colour and Images
- Forms and Controls

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THE HUMAN PROCESSOR

- Input
 - senses
- Process
 - Cognition
 - Knowledge
 - Skills
 - Reasoning
- Storage
 - Memory
- Output
 - Actions
 - Speech



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SENSES

Human

- Vision
- Hearing
- Smell
- Taste
- Touch
- Kinaesthetic / proprioception

Computer devices

Input output

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CURRENT COMPUTER SYSTEMS

- Mostly output is to a visual display.
 - And the display is also the input medium on phones etc!
- Exceptions
 - Sound
 - Vibrate



VISION

Two stages in vision

- physical reception of stimulus
- processing and interpretation of stimulus

THE EYE - PHYSICAL RECEPTION

- mechanism for receiving light and transforming it into electrical energy
- light
 - Reflects from objects (e.g. paper)
 - Or is produced from a light source (e.g. a display)
- images are focused upside-down on retina
- retina contains rods for low light vision and cones for colour vision
- ganglion cells (brain!) detect pattern and movement
- Interesting web site
<http://www.hhmi.org/senses>



INTERPRETING THE SIGNAL (CONT)

- Luminance (Brightness)
 - subjective reaction to levels of light
 - affected by luminance of object
 - visual acuity increases with luminance as does flicker
- Colour
 - made up of hue, intensity, saturation
 - cones sensitive to colour wavelengths
 - blue acuity is lowest
 - 8% males and 1% females colour blind are severely colour blind



LUMINANCE (BRIGHTNESS)

- Rods provide low-light monotone (grey scale) vision. Rods are saturated in bright light and contribute little or nothing to what you see.
- However the principles of brightness and contrast are equally important with colour vision.

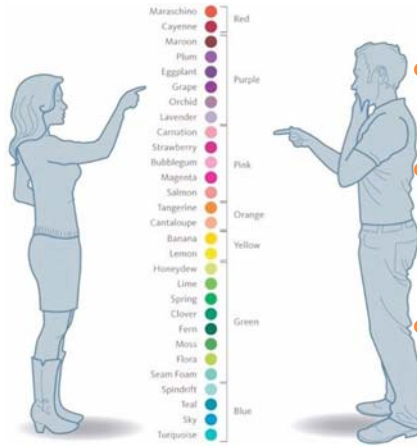
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HALF TIME ENTERTAINMENT

- <https://www.youtube.com/watch?v=DCu1G2rxj5c>
- There are a few naughty words in this clip so if you are easily offended don't watch.

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COLOUR AND GENDER



- Women see more colours than men (on average)
- Perhaps 80% of men are colour blind .. depending on how you measure it. ☺
- There is a difference between seeing the colours on a chart and seeing them in isolation

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FEATURES

Vital Training
Business Training courses that deliver results

EEO Trust Work and Life Awards 2012
Supporting the EEO Trust Work and Life Awards

The Auckland Chamber of Commerce Awesome Service Awards

Join the Chamber
Find out the top four benefits to your business of joining the Chamber.

Business Changing
Grow Your Profitability and Performance
A comprehensive course for business owners and general

CHAMBER CALENDAR [READ MORE](#)

09 August 2012
Lunch with the Prime Minister John Key

10 August 2012
India Business Leaders Forum Breakfast

16 August 2012
Mercury Speed Networking Goes West

23 August 2012
Quarterly Economic Update 3pm

23 August 2012
Quarterly Economic Update 8am

PARTNERS [READ MORE](#)

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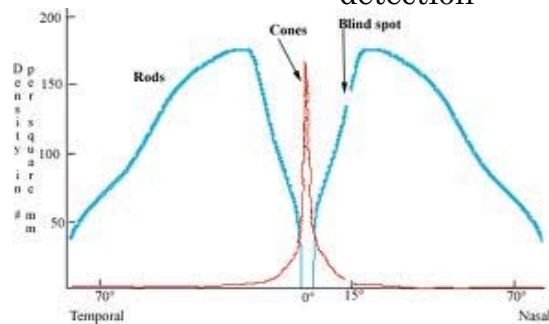
CENTRAL VERSUS PERIPHERAL VISION

Central

- More cone cells
- Better detail and focus

Peripheral

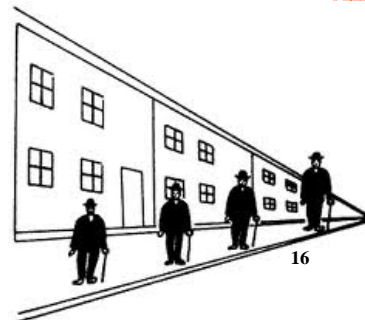
- Less cells in general and more rod cells
- Good movement detection



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INTERPRETING THE SIGNAL

- Size and depth
 - visual angle indicates how much of view object occupies (relates to size and distance from eye)
 - visual acuity is ability to perceive detail (limited)
 - familiar objects perceived as constant size in spite of changes in visual angle when far away
 - cues like overlapping help perception of size and depth
- What does this mean for items on the screen periphery?



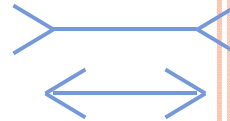
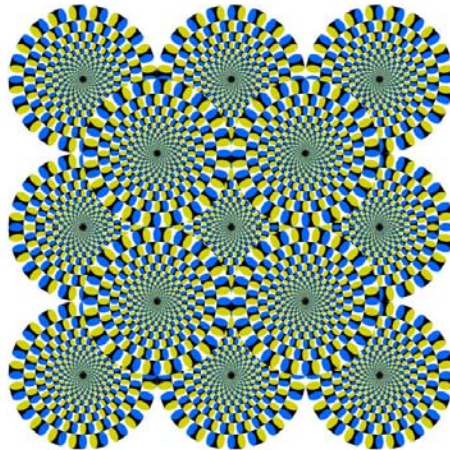
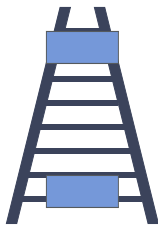
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INTERPRETING THE SIGNAL (CONT)

- The visual system compensates (to some degree) for:
 - movement
 - changes in luminance.
- Context is used to resolve ambiguity
- Optical illusions sometimes occur due to over compensation

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OPTICAL ILLUSIONS



<http://michaelbach.de/ot/>

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READING

- Several stages:
 - visual pattern perceived
 - decoded using internal representation of language
 - interpreted using knowledge of syntax, semantics, pragmatics
- Reading involves saccades and fixations
- Perception occurs during fixations
- Word shape is very important to recognition
 - There are two main theories about how we read, one from psychology and one from typography... suffice to say, that either way the same things are important

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WORD SHAPES

a is at
I like the dog

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WHEN YOU ARE SURFING THE WEB THIS WEEK

- If you have trouble finding something you know must be on a page
- Look to see why that is
 - Is it on an edge?
 - Is the colour wrong?
 - Is the font too small?
- Put some examples up on the class forum – link and your comment as to what was good/bad about the visual layout
- We will come back to the details for design over the next few lectures.

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WHAT IF

- Your visual attention is need for another activity
 - Driving & cell phone / gpa navigation....
- Are colour blind?
- Needed reading glasses?
- Have really poor eye sight that cannot be corrected by glasses?
- You are blind?

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TO BE CONTINUED

- Next lecture we'll move from perception to aesthetics,
- But don't forget aesthetics is all based on our perception