

Our Peripheral Vision is Poor

# Our Peripheral Vision is Poor

- Again the notes here are heavily based on Jeff Johnson's book
- Designing with the mind in mind

# Our Peripheral Vision is Poor

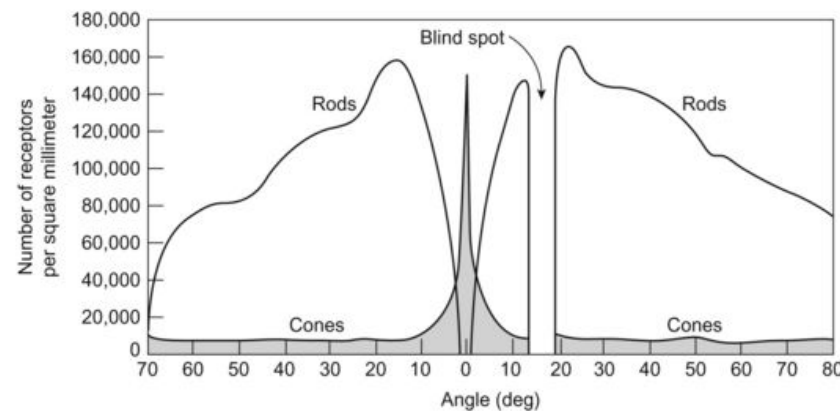
- In the previous lecture we saw that human vision in terms of colour is different from camera vision
- It also differs in terms of resolution
  - A camera has even resolution across its CCD
  - Whereas the eye has an uneven distribution of resolution

# Our Peripheral Vision is Poor

- What we will end up covering today is the following
  - Why stationary objects in muted colours in the peripheral vision are not noticed
  - But motion is noticed in the peripheral vision

# Our Peripheral Vision is Poor

- Resolution of the fovea compared to the periphery
  - The majority of the resolution within the human eye is right at the center where the fovea
  - The resolution rapidly drops from the center towards the periphery
  - Fovea is only 1% of retina but visual cortex devotes about 50% of processing power to it

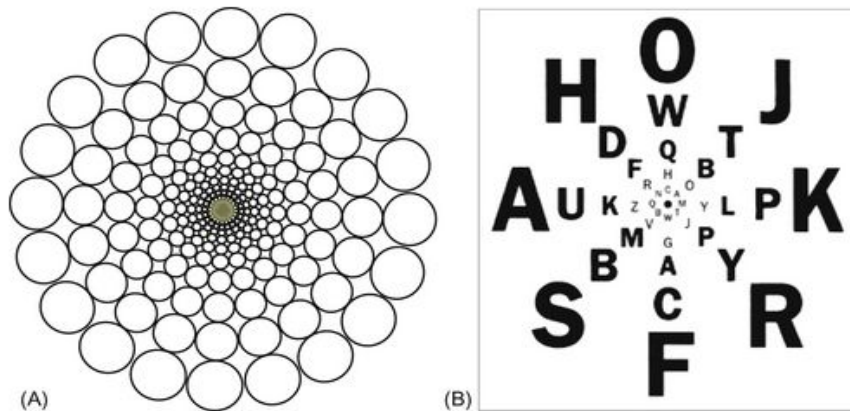


# Our Peripheral Vision is Poor

- That's not all
  - Information on the fovea is not compressed
  - Information on the periphery is loss compressed
  - Resolution at the fovea is much higher than that of digital cameras
  - However towards the periphery the resolution is only a few dots per inch

# Our Peripheral Vision is Poor

- On first observation of this you may think and wonder why we see the world as clearly as we do
  - The reality of the matter is that unconsciously we are making eye movements
  - To get as much of the world perceived by the fovea
  - The bits that aren't covered by the fovea are then filled in by the brain



# Our Peripheral Vision is Poor

- How does it fill in the information?
  - Fills it in based on what we have come to know and expect
  - According to Clark's research from 1998
    - A high resolution model is not kept in the brain
    - Brain will order eyes to resample as necessary.



# Our Peripheral Vision is Poor

- The research went a step further
  - Had a computer tracking the eye position of the user
  - Only showed text in the area where the user was focused
  - Random noise elsewhere
  - Not only do people read normally they do not notice the noise

# Our Peripheral Vision is Poor

- To go a step further the fovea is the only area of the eye that has the required resolution for reading
  - And also the small area surrounding it
  - The rest of the visual field is incapable of reading
  - The end result is that reading requires a lot of eye movement

# Our Peripheral Vision is Poor

- The distribution of cones also affects our colour perception as well as spatial resolution
  - Colours are much easier to distinguish in the center of vision as compared to the periphery
  - Because there are more cones there

# Our Peripheral Vision is Poor

- Interestingly there is also a spot in our vision where there is zero visual information
  - The blind spot
  - Where the blood vessels and the optic nerves leave the eyeball
  - No cones and rods there
  - You don't notice it because your brain fills in the gaps based on surrounding information

# Our Peripheral Vision is Poor

- At this point you may wonder what use the periphery is
  - Contains very little information about our environment
  - However, it is there is provide low resolution information for guiding eye movement
  - May trigger the brain into changing eye focus
  - Useful as our eyes do not scan the environment randomly

# Our Peripheral Vision is Poor

- Information that is used by the brain to plan what areas should be focused on next
- Also affected by goals
  - e.g. if you are looking for a red apple your peripheral vision will look for round red patches of colour
  - May or may not be the object you are looking for

# Our Peripheral Vision is Poor

- An example of an object as seen in peripheral vision
  - Although it is low quality there is enough information there
  - To inform your brain that there is something the approximate shape of an animal
  - Brain will order viewing of that object to determine if it is harmful



# Our Peripheral Vision is Poor


- Examples from user interfaces
  - Helps to explain why error messages are not noticed in applications
  - Error message is so far away from focus
  - Makes it difficult to notice and react to





# Our Peripheral Vision is Poor

- Even when an error is shown close to the focused area there may be other objects that will prevent the error from being seen
  - Here is an error message that is closer
  - But not easily visible
  - Why?



RETURNING CUSTOMER LOGIN

Login ID not found.

Login ID:

Password:

☐ Remember my Login ID for faster logins.

# Our Peripheral Vision is Poor

- 1) it is still in peripheral vision
  - As the fovea only comprises a 1cm to 2cm squared box
- 2) the error message is not the only thing in red
  - Look at the title



# Our Peripheral Vision is Poor

- Common methods of making errors visible to users
- Put it where the user is looking
  - When interacting with a GUI people are predictable in where they look
  - Particularly in western cultures (top to bottom, left to right)
  - When using a pointer they will focus on pointer or to where it is going
  - When a user clicks a button they will focus on that button for a few moments then and after

# Our Peripheral Vision is Poor

- Mark the error
  - Place an error message near to the area that it is refering to
  - Unless that error will be too far away
  - Might be other objects in the way

# Our Peripheral Vision is Poor

- Use an error symbol
  - A particular favorite of IDEs including Eclipse
  - Gives an instant idea as to where the error may have occurred
  - Might give your user a chance to fix it before they have to read the error message

# Our Peripheral Vision is Poor

- Reserve red for errors
  - If at all possible when designing your GUIs try and reserve the colour red for errors
  - A colour that most people associate with error, danger, problems etc
  - Using it for other information may cause misinterpretation

# Our Peripheral Vision is Poor

- Here is an example of a reworked page that will make users notice errors better when they occur



The screenshot shows the Informaworld website interface. The top navigation bar includes links for HOME, ABOUT US, CONTACT US, eBooks, Journals, Reference Works, and Abstract Databases. A search bar is present with a dropdown menu set to 'entire site'. Below the search bar, there are links for 'Browse Publications A-Z', 'Browse Subjects A-Z', and 'Advanced Search'. The main content area is titled 'My Account' and contains a 'Register' button. The 'Register' section has two sub-sections: 'Personal Registration' and 'Institutional Registration'. The 'Personal Registration' section includes a sign-in form with fields for 'Username:\*' and 'Password:\*', a 'Sign in' button, and a 'forgot password?' link. A red error message is displayed below the sign-in form: 'Username/password combination was not recognised.'

informaworld<sup>™</sup>  
HOME · ABOUT US · CONTACT US

eBooks Journals Reference Works Abstract Databases

Search  in   ?  
or Explore   ?

· Browse Publications A-Z  
· Browse Subjects A-Z  
· Advanced Search

SIGN IN Register Why Register? Got a Voucher?

My Account

My Account Register Subscriptions Purchases Shopping Cart Alerts Marked Lists Saved Searches

Register

Personal Registration  
Creating a personal account will allow you to create marked lists, request email alerts, set up personal subscription access and buy personal subscriptions online.

Institutional Registration  
Register your institution to purchase an online subscription for your organisation.  
Note that accounts already exist for subscriptions purchased off-line. Please contact us for more information.

Already registered? · Please sign in to access an existing account.

Sign in

Username:\*

Password:\*

\*case sensitive  ?

[ forgotten password? ] [ Athens users click here to sign in ] ?

! Username/password combination was not recognised.

# Our Peripheral Vision is Poor

- Here is an example from AOL
  - Where errors are shown right next to the area that they concern
  - Notice the text immediately below the text field
  - Following the viewing pattern of users

**Create a Free Email Address**

[Already a Member? Click here](#)

\* First Name:  ✓

\* Last Name:  ✓

\* Desired Email Address:  @aol.com  
3-16 letters or numbers. It must start with a letter.

\* Password:  Password Strength  

Please enter a Password that is 6-16 characters using only letters and numbers.

6-16 letters or numbers.  
[Help for creating a secure password.](#)



# Our Peripheral Vision is Poor

- Dialog boxes
  - Heavy artillery that is to be used sparingly
  - An in your face approach
  - Interrupts the user's work and demands immediate attention
  - Should only be used when the error message denotes something critical

# Our Peripheral Vision is Poor

- Even worse if they are modal dialogs
  - Users cannot interact with the application until the dialog is dismissed
  - Non modal will appear but can be ignored till later
  - Best example of a modal dialog is save before quit
    - As this is a critical condition

# Our Peripheral Vision is Poor

- Use sound
  - Users will by reaction start to scan the screen for what caused the beep
  - Particularly if the error is a distance away from where it occurred
  - Not great in open plan/noisy environments
  - Also users tend to mute their sound a lot

# Our Peripheral Vision is Poor

- Flash or wiggle briefly
  - Particularly useful if in peripheral vision
  - Users will notice quickly
  - Again as in your face approach
  - Will break user work flow
  - Should be no longer than .25 or .5 of a second