Our Peripheral Vision is Poor:

Designing with the Mind in Mind: Jeff Johnson Chapter 5

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# Brief Overview of Today's Content

- Why do humans have poor peripheral vision?

- Importance of Peripheral Vision

- Implications of the Periphery

- Making Error Messages Visible

- Successfully Designing User Interfaces with this Knowledge

- Peripheral "Pop" and Visual Search

- Discussion/Q&A

The Camera versus The Human Eye

In a camera:

- the photoreceptive elements are spread uniformly in a tight matrix

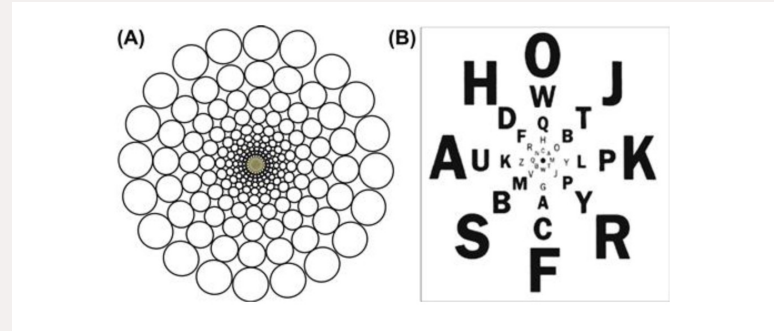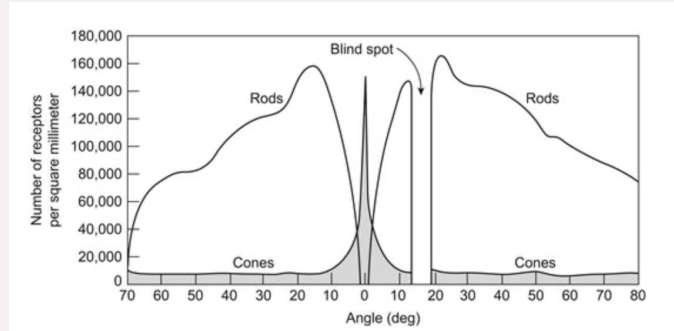- spatial resolution* is constant across the entire image frame

But the Human system is different...
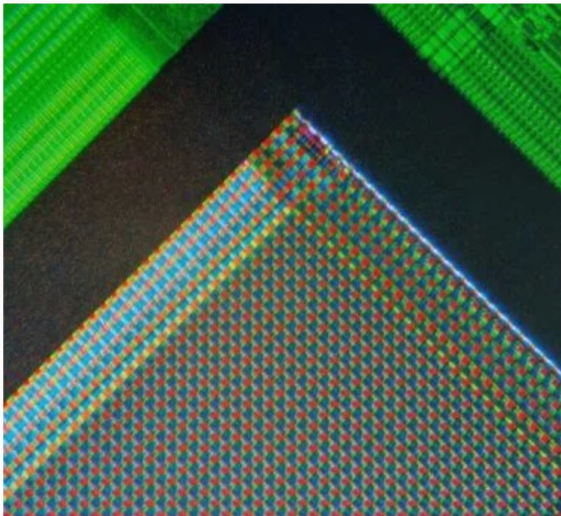
The photosensor array of a web cam

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How?

For humans,

The spatial resolution drops greatly from the center to the edges.

This is because:

=> Pixel Density: Our cones (~6-7 mil. in each eye) are tightly packed in the center of our visual field in a small region called the fovea*.

=> Data Compression: the information from the peripheral vision is compressed before heading to the brain while info from the fovea is not.

=> Processing Resources: The brain's visual cortex devotes about half of its area to input from the fovea even though it's a very small part of the retina**

*depressed region in the eye that has the highest visual acuity.
**the light sensitive area at the back of your eye that sends images to the brain

Both from: DWTMIM Ch. 5

The result of this difference

Our vision has much, much greater resolution in the center of our visual field than elsewhere

From: https://www.sciencedirect.com/topics/computer-science/peripheral-vision

With a single glance of your eyes:

At the periphery, we only detect large-scale contrast and minimal color

From: https://www.cambridgeincolour.com/tutorials/cameras-vs-human-eye.htm#resolution
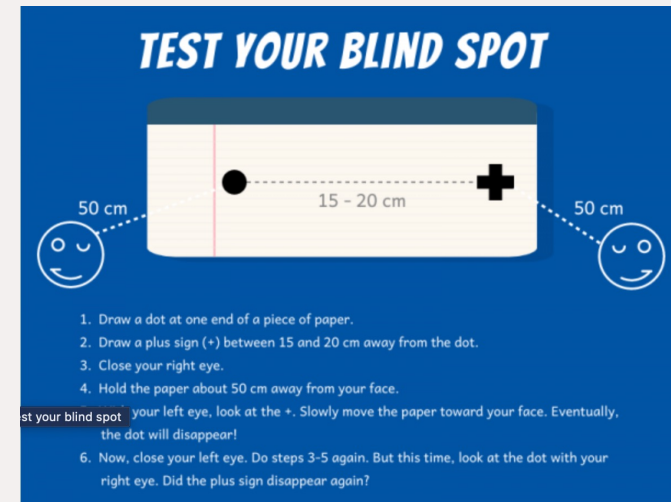
You have never really noticed, have you?

- This is primarily because your eyes move constantly and rapidly so that your fovea is focuses on small pieces at a time and the brain fills the perceptual gaps

It's all an ILLUSION!

- Peripheral vision affects website design: ex. if font is too small, fovea captures a lot and we get lost, if font too big, we cannot read

Text could also fall into the blind spot

TEST YOUR BLIND SPOT

50 cm   15 - 20 cm   50 cm

1. Draw a dot at one end of a piece of paper.
2. Draw a plus sign (+) between 15 and 20 cm away from the dot.
3. Close your right eye.
4. Hold the paper about 50 cm away from your face.
5. [with] your left eye, look at the +. Slowly move the paper toward your face. Eventually, the dot will disappear!
6. Now, close your left eye. Do steps 3-5 again. But this time, look at the dot with your right eye. Did the plus sign disappear again?

est your blind spot

From: https://letstalkscience.ca/educational-resources/stem-in-context/eye-vs-camera

Now that we know our peripheral vision is poor, what's next?

Guides Fovea: It provides low resolution clues so that we get the fovea to look at something

Detects motion: For example, soccer players could use cues from their peripheral vision as to the location of their opponent whilst their eye tracks the ball

See better in the dark: Peripheral vision is mostly rods, so it does well in caves and in the night

UI Examples

Error is in the low resolution periphery

From DWTMIM Chapter 5

UI Examples: Still Not Enough

The fovea is just about 1-2cm on a screen

Error message is not the only thing that is red!

From DWTMIM Chapter 5

Common Methods of Making Errors Visible

- Put Error Messages where users are looking

- Mark the Error

- Use an Error Symbol

- Reserve red for errors

From DWTMIM Chapter 5
https://www.nomensa.com/blog/ux-design-four-ways-display-error-messages

Stronger ways of making users aware of Error Messages

- Pop Up Message in Dialog Box
- Use Sound 🔊
- Wiggle or Blink briefly

Use these methods sparingly to avoid habituation*

*Repeated exposure that dulls our perceptual sensitivity

Peripheral "Pop" and the Visual Search

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Usually, visual search is linear

Having contrast or a "pop" such as color, boldness, indenting, titles, motion helps to have a faster non-linear search

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In Summary: Reduce Visual Search
　　　　　　　Make important information stand out

Peripheral "Pop" in Design

Makes important information stand out and visual search non-linear
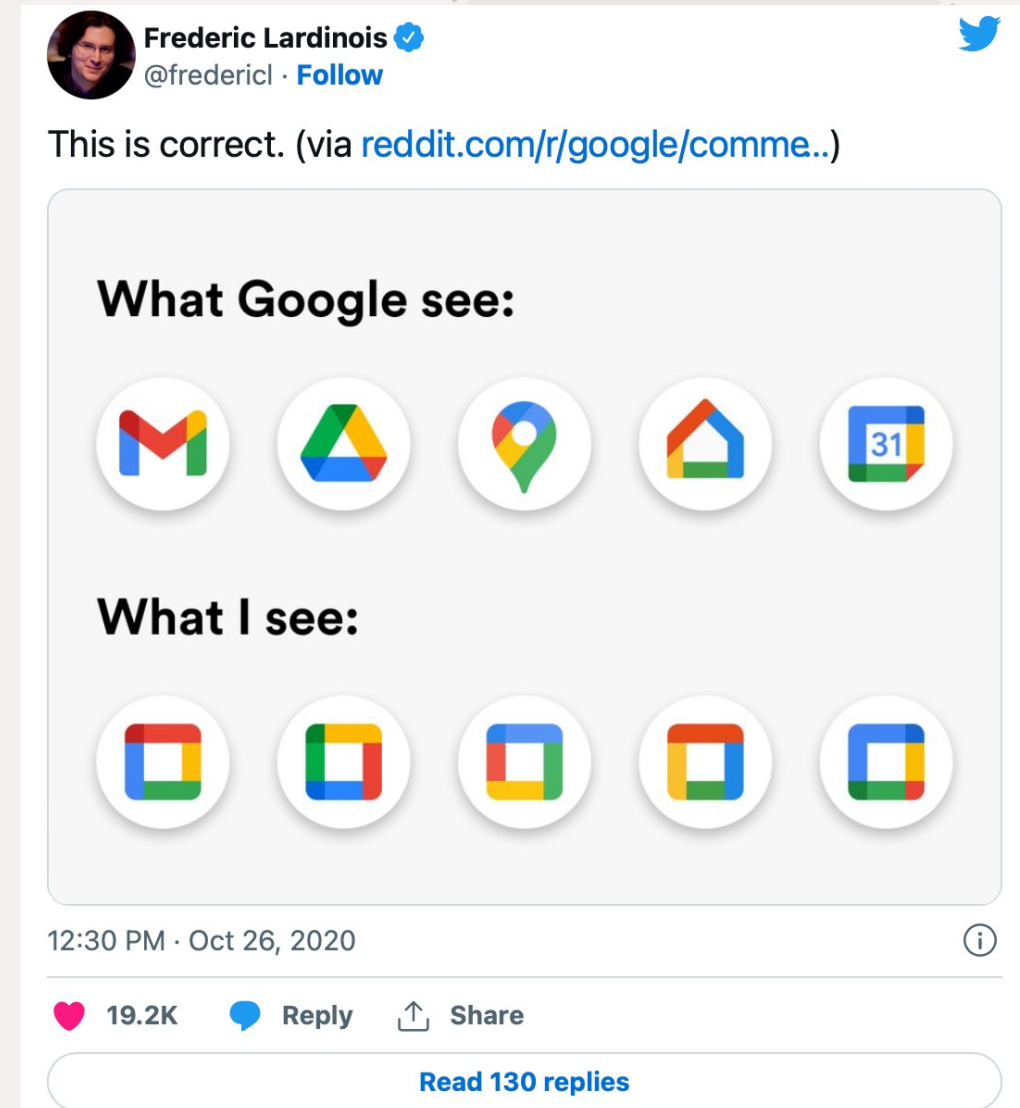
Wait... any one of these could be a user's target

From: my laptop

In this case...

- Try to design icons distinctively
- Try to keep things static so that users can know where the most frequently visited things are : No Dynamic Menus

What do these icons represent?

From: https://techcrunch.com/2020/10/06/googles-new-logos-are-bad/

Now that we have all that knowledge...

What would you change about the following websites? (based on what we learned today)

Final Note

How would you embody the design lessons that we have learned today in your project?

Hopefully this has you thinking!

Thank You for listening!