THE ILLUSION OF REALITY

• “Virtual reality works because reality is virtual”
  – Lawrence Stark, UC Berkeley

THE ILLUSION

• We experience a high-resolution spatial and temporal continuum when we look around the 3D environment we are in.

• This is an illusion!
The retinal image of the visual field is in focus only in a very small area: The fovea.

We need to sample the visual field, with saccades and fixations (~3 per sec.) to construct an image.

scanpaths and what we see
THE ILLUSION

• Sampled information is relatively sparse when you walk into a room. You see the typical things and think you have seen the whole room.

• You can change the way that you see by changing perceptual filters.
• For example: “I want to see squares”…

“I want to see squares”
"I want to see circles"

THE ILLUSION

- Fixating ~90% of the time.
- Checking and rechecking points of interest, as if gathering support for what we think we are seeing.
- It is hard to overcome strong presuppositions, such as what a room looks like...
... or what a vase looks like

(a) Seampath for two laces
(b) Seampath for vase
THE ILLUSION

- We see what is in our mind’s eye, and use sampled visual information to verify this.
- The scanpath is driven by our mental model. Change the model and the scanpath changes.
THE ILLUSION

• Our model can even make us see things that we don't have any sensory data for!

THE ILLUSION

• That’s a good thing, because we are actually missing some data...
THE ILLUSION

• Can you find your blind spot?

THE ILLUSION

• Information is integrated across neighboring areas.

• It’s image processing!
THE ILLUSION OF 3D WORLDS

3D WORLDS

• How do we perceive immersion in a 3D environment?
  – Physiological cues
  – Stereoscopic cues
  – Static cues
  – Motion cues
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3D WORLDS

• How do we perceive immersion in a 3D environment?
  – Physiological cues
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  – Motion cues

But even if we close one eye we see the world in 3D – how can that be? (also on TV etc.)
interposition / occlusion

shading

shading
3D WORLDS

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1/7/2008

3D WORLDS

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3D WORLDS

• To sum up - Paint the 3D world into the mind of the receiver:
  – Build a mental model with expected behavior.
  – Address the expectations.
  – Avoid contradictions.
  – Build layers of strong consistent cues.
spot the cues?

size, occlusion, shadow, color, texture gradient, linear perspective

spot the cues?
Other interesting pictures...